

COMPUTERWORLD

SPECIAL REPORT:
ADVANCES ON THE PC FRONT
Hardware, software, and more

IN THIS ISSUE

NEWS

4 Variety may be the spice of life, but DEC would like to see its minicomputer customers stick with it for PCs as well.

8 HP rebounds into profit, closing its second quarter with double-digit gains.

8 Borland sits down at IBM's OS/2 developers' workbench to create tools and programming languages.

10 The similarity is there, but Cincom's AD/Advantage is no kin to IBM's AD/Cycle: It offers more facilities and runs multiple platforms.

12 OLE! Flinging wide the gates to Object Linking and Embedding, HP commits its New Wave application to support future upgrades of Microsoft's Windows.

14 It's slow good: Software Publishing is hoping users of its Harvard Graphics presentation package will think the latest upgrade is worth the wait.

16 User groups of the former Management Science America and McCormack & Dodge will sing in union when plans to blend the two voices into one chorus reach a crescendo at this year's Intersect conference.

139 There are exceptions to the rules, but IBM continues to prove the theory that hardware vendors rarely become tough contenders in the software arena.

140 Can users overcome their concerns about the merger with AT&T long enough to give NCR's System 3600 a fair shake?

Quotable

"I used to be that you would have to chuckle when you said Digital and PC in the same breath. I don't think you should chuckle anymore."

STEVE LAIR
DATAQUEST

On DEC's latest dive into the PC market. See story page 4.

SYSTEMS & SOFTWARE

29 Commercial IS shops are dazed by a variety of Unix versions from which to choose as they take steps toward open systems.

PCs & WORKSTATIONS

47 IBM has a tough row to hoe to help OS/2 plow ahead of Microsoft's Windows 3.0 operating system.

57 Technology Analysis: Everest Systems' Tempo LX 386SX is not the most powerful notebook, but it's dependable, while AST Research's Premium Exec 386SX20 sacrifices size to gain performance.

NETWORKING

63 The Washington Post embraces networked IBM PS/2 systems and servers to write off any potential downtime disasters.

MANAGER'S JOURNAL

89 Blue Cross/Blue Shield of Massachusetts proves it is not immune to the benefits of HMOs as it shifts its focus to managed health care.

COMPUTER INDUSTRY

115 DEC Japan President Edmund J. Reilly, living proof that a U.S. high-tech firm can succeed in Japan, gives insight into U.S./Japan trade relations.

SPECIAL REPORT

95 'Choice' is still the key word for PC users as machines flex power and versatility while losing bulk.

IN DEPTH

113 Schools put a real-world business spin on their IS curricula. By Lucie Juneau.

DEPARTMENTS

- 6, 140 News Shorts
- 20 Advanced Technology
- 24 Editorial
- 91 Calendar
- 121 Computer Careers
- 132 Marketplace
- 136 Education & Training
- 138 Stocks
- 142 Trends

EXECUTIVE BRIEFING

■ The PC industry is in turmoil as Comdex/Spring '91 opens today in Atlanta. Businessland shocks the industry and customers with a \$43 million loss, while Compaq warns of a 15% plunge in sales. Declining IS budgets and the U.S. economic downturn are taking their toll, and the PC price wars continue unabated. Page 1. Comdex attendance may suffer as well, as corporate budgets are feeling the pinch of travel expenditure cutbacks. Page 141.

■ IBM spins off its outsourcing business into a wholly owned subsidiary. The move comes in apparent response to critics, who have charged that the outsourcing business violated the 1956 Consent Decree. Ironically, the action may make IBM an even stronger outsourcing competitor. Page 1.

■ Striking the right balance between technical know-how and business understanding is posing unprecedented challenges for IS professionals. Proper training, career paths and career choices are much more complicated than they once were. First of a two-part series. Page 121.

■ IBM's report card as a software vendor varies widely among market segments: unparalleled success with DB2, some embarrassing failures in PC software and a mixed bag in Unix. Part 2 of a three-part series. Pages 1 and 139.

■ The NCR 3600 may be the first victim of the merger with AT&T, as potential buyers adopt a wait-and-see posture on the firm's future. They worry about AT&T keeping its "hands-off" promise. Page 140.

■ Minicomputer industry woes continue as Prime announces an \$84 million quarterly loss and plans to cut 800 jobs through attrition. Meanwhile, Wang loses a key veteran development executive to DG. Pages 4 and 10.

■ On-site this week: Kegan Management in San Jose, Calif., relies on Norton-Lambert's Close-up communications software to help run its businesses — and sell them off. Page 1. Minicomputer sales rule the roost at aluminum producer Alumax, where Prime 50 series CPUs run business, database and maintenance functions. Page 33. The Federal Reserve Bank in Baltimore is wrestling with standards for PC hardware, software and LANs as it attempts to migrate mainframe applications to 20 LANs. Page 49.

■ University IS programs are stressing technology use over printers. They are getting firms more involved in school curricula and encouraging IS chiefs to teach and lecture. Page 113.

■ Sabbaticals for IS em-

ployees can be an effective way to attract, motivate and get the most productivity from them. There are potential downsides, but sabbaticals are generally viewed positively. Page 89.

■ Personal computers are becoming both more and less personal: They are packing more power and functionality per inch but also giving capabilities that make them much more of a peer player in enterprise networks. Page 95.

■ Gray market goods — new PCs, mainframes and minicomputers sold through unauthorized reseller channels — offer discounts of 40% and higher for the educated shopper. Page 132.

■ Take the regulatory wraps off AT&T, a group of 14 large enterprises urges. In a study commissioned but reportedly not controlled by AT&T, users blame federal regulation for costly and frustrating delays in signing up for Tariff 12 and other services. Competitors MCI and Sprint question the study's objectivity. Page 8.

■ On-site this week: Kegan Management in San Jose, Calif., relies on Norton-Lambert's Close-up communications software to help run its businesses — and sell them off. Page 1. Minicomputer sales rule the roost at aluminum producer Alumax, where Prime 50 series CPUs run business, database and maintenance functions. Page 33. The Federal Reserve Bank in Baltimore is wrestling with standards for PC hardware, software and LANs as it attempts to migrate mainframe applications to 20 LANs. Page 49.

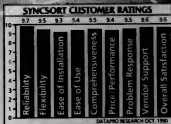
The 5th Wave



SYNCSORT. WHERE BUSINESS TURNS FIRST FOR SORTING EFFICIENCY.

...continuing to outperform all competition. Last year, customers have ranked Syncsort the highest marks for reliability, efficiency, ease of installation, ease of use, technical support, and user education. Working in partnership with businesses of all sizes, Syncsort helps them get the fastest, most efficient sorts.

For increased productivity and greater savings, choose the sorting solution that the Fortune 100 turn to first...Syncsort.



syncsort
INC.
50 Tice Boulevard, Woodcliff Lake, NJ 07675
800-535-3355

DEC aims PCs at its own users

But in spite of industry praise, minicomputer buyers are not converted

BY RICHARD PASTORE
OF STAFF

Digital Equipment Corp.'s new line of personal computers and portables has earned the company rare respect from industry analysts. But DEC minicomputer users accustomed to looking to other vendors for PCs may need further convincing.

DEC has been hurt by its inability to sell PCs to minicomputer network customers. With the new high-end systems, it is also hoping to lure customer desktop defections to workstation-level boxes from rival vendors.

However, DEC must win over a customer base already set in its PC ways. "I don't see us running out and buying a bunch of them just because they're Digital," said Stephen Gruenberry, coordinator of DEC's PC systems architecture at Bechtel Corp. in Norwalk, Calif. The firm has already standardized on Compaq Computer Corp. PCs.

"We looked at DEC PCs in the past but avoided them because of their prices," said Timothy Kahn, MIS manager at Suncoast Fibre Development, Inc. in Marietta, Ga. He buys Hewlett-Packard Co. PCs and clones to run on DEC Pathworks networks.

Nevertheless, DEC's aggressive



Ken Olson (left) and Andrew Grove announce PC line

pricing and emphasis on networking and graphics are indications that the company should be taken more seriously in the PC arena, some analysts said.

"It used to be that you would have to chuckle when you said Digital and PC in the same breath. I don't think you should chuckle anymore," said Steve Lutz, chief PC analyst at Dataquest, Inc. in San Jose, Calif. The product line announced last week will pose a significant challenge to the market, he said.

Other observers were particularly impressed with the design and entry price of the new PC

workstation, the DECPC 433 Workstation. It combines Intel Corp. 1486 architecture with workstation-level graphics of 1,280- by 1,024-pixel resolution and is priced starting at \$5,999. In comparison, the company's earlier 25-MHz 486 price ranges from \$6,920 to \$10,475.

Workstation hybrid

The new model, built and designed in conjunction with Intel, comes with 6M bytes of memory and can be configured with up to 1G byte of storage. It supports DEC's Pathworks network software as well as DOS, OS/2 and various Unix incarnations.

This PC/workstation hybrid makes perfect sense for DEC, which must distinguish its PC line from other clones and has workstation experience to leverage, said Paul Zagarek, an analyst at The Yankee Group in Boston.

It may already be too late for DEC at some sites, such as Bradley University in Peoria, Ill. The university is about to replace its last VAX server with a Sun Microsystems, Inc. 470. "Based on price/performance, we chose the Sun 470," said Joel Hartman, associate provost of information technology and resources.

DEC also announced the 433T desksize system, intended for both client and server use. Also a 33-MHz, 486-based system, it incorporates the Extended Industry Standard Architecture bus, 4M to 64M bytes of memory, eight slots and 10 storage bays. Pricing for the system, designed and manufactured in partnership with Tandy Corp., starts at \$11,995.

The other introductions were notebook- and laptop-type PCs made in conjunction with Intel. C. Olivetti & Co. The 33-MHz Intel 80386DX laptop weighs 11 pounds and offers a 60M-byte hard disk, an integrated mouse pad and a price of \$6,450. The 6.2-pound notebook uses an Intel 20-MHz 80386SX chip and comes with a 60M-byte disk and up to 2M bytes of memory. It sells for \$4,895. There is also a desktop expansion chassis option for the unit.

COMPUTERWORLD

Editor in Chief

Bill Calton

Executive Editor

Paul Gills

News Editor

Steve Barwick

Assistant News Editor

James Connolly

Book Editor

Cheryl Walker, Managing

Editorial Assistant

Patricia Kende, PC & Workstations

Michael Alexander, Advanced Technology

Inventory Hardware, Systems & Software

Neil Margolis, Inventory

Marketing, Systems & Software

Book Editor

James M. Weller

Book Editor

Richard P. Pomeroy

Staff Writer

John C. Smith

Staff Writer

Carol Hildebrand

Champion Lincolnton

New Products Editor

David Shaw

Research & Development

James K. Baker

Staff Writer

Michael J. O'Brien

Staff Writer

Joseph Higgins

Staff Writer

Michael J. O'Brien

Staff Writer

David S. Jones

Staff Writer

Alvin J. Ryan

Assistant Editor

Carlton J. Duffy

Staff Writer

James E. Hyman

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Staff Writer

Wang exec defects to DG

LOWELL, Mass. — Gerald Paul, longtime Wang Laboratories, Inc. executive and, until recently, vice president of systems and communications development, left Wang last week to join Data General Corp., based in Westborough, Mass.

Paul will assume the title of vice president of Eclipse development from June 3. He will report to Joel Schwartz, vice president and general manager of the Eclipse business unit.

Paul was at Wang for 12 years and was responsible for much of the company's proprietary VS systems development and marketing efforts. His successor has not been named.

Frank Ryan, vice president of corporate communications at Wang, said the VS computer line will not suffer, adding that the company has a strong management and development team in place.

He said Chief Executive Officer Richard Miller is "clearly building his own management team. Some people are going to be on it and some aren't." Paul was unavailable for comment.

VAX 9000

FROM PAGE 1

because of DEC's move to the RISC-based Alpha VAX and its anticipated price/performance improvements. However, a comparable Enterprise System/9000 mainframe from IBM will be worth 33% of current list price by 1994, said Peter Schay, an analyst at the Stamford, Conn.-based consulting firm.

"DEC needs to provide a lease rate or package that protects the user from this kind of depreciation," Schay said.

DEC officials are scheduled to meet with Kerns next Monday to discuss an as-yet-unannounced program address to provide that security blanket. Kerns will be hearing about DEC's three-part plan to provide "100% protection in hardware, software, peripherals and company assets," said Rich Whitman, group marketing manager for information systems business at DEC.

The plan includes enhancements for VAX 9000 hardware and software, migration to RISC-based Alpha VAX by 1994-95 and business practices to "largely invest" in the use of large systems servers.

Although Whitman would give no further details on the fi-

nancial protections DEC will give certain customers, he did say one likely offering will be technology upgrade leases similar to what IBM provides. "We are going to guarantee the investment of the customer, and there will be real, hard money tied to it," Whitman said.

An upgrade lease protects the residual value of machines as they age, Schay said.

"DEC is going to be much more sophisticated about leasing and financing strategies for its mainframe users," Schay said. "But if the VAX 9000 sales stay mixed at 70 systems a quarter, DEC won't be able to afford the kind of investment it takes to stay in that business."



Kerns, executive from DEC

CORRECTIONS

Because of a transcription error, which appeared in the April 29 issue of *Computerworld* said Legent Corp. posted a loss for its second quarter, ended March 31. In fact, Legent reported a \$7.5 million third-quarter profit.

The chart accompanying the "TI

GTE Mobile Communications became the second-largest cellular telephone company in the nation after the mid-March merger of GTE and GTE Corp. Now a service company for GTE Mobile and GTE Cellular, the new firm is expected to be quadruple to 2.5 million by 1995.

Kerns stated that in going for an extensive VAX-based client/server environment hinge on the VAX 9000 leading the technology curve. "If DEC is not going to be successful with [the VAX 9000], we want them to share our risk, whether that means paying for a conversion or buying back the equipment," he said.

sends James Martin del' article [CW, April 15] inaccurately estimated the computer-aided software engineering tool market share for Texas Instruments, Inc. as 9.3%. The correct figure is 7.1%. Inaccurate information was provided to *Computerworld*.

For Security Across Multiple Hardware Platforms, There's Only One Safe Choice.

Trojan Horses. Logic Bombs. Worms. Hackers. Viruses. Disgruntled employees. Information systems today are under siege.

Every enterprise, every environment, every system is vulnerable.

Unless it's protected by CA-UNIPACK®/SCA.



Only CA-UNIPACK/SCA provides comprehensive, integrated security across all of your most important hardware platforms and operating systems.

CA-UNIPACK/SCA is a proven, practical solution that includes the most advanced security, control and audit software in the world.

It offers you a secure, protected environment across multiple hardware platforms, operating systems and wherever your distributed processing takes you including MVS, VSE, VM, VMS, networks, DB2 and PC/DOS.

CA-UNIPACK/SCA provides access control, VTAM network control, network session management capabilities and an automated approach to reviewing operating environments. It also offers you enhanced administrative flexibility, unsurpassed ease of use, single point access, and extensive auditing & reporting.

But most importantly: CA-UNIPACK/SCA gives you total control of access to one of your most important corporate assets: information.

And now, with our **CA 9000** Computing Architecture For The 90s, CA-UNIPACK/SCA can deliver even higher levels of integration and provide total data center automation by working seamlessly with other CA-UNIPACKS that automate Production, Storage, Performance Management, and Data Center Administration.

To learn more about CA-UNIPACK/SCA call 1-800-645-3003 and find out where your organization may be vulnerable.

Before
someone
else does.

**COMPUTER
ASSOCIATES**

NEWS SHORTS

Apple shows ISDN applications

Apple Computer, Inc. demonstrated new Integrated Services Digital Network (ISDN) applications last week at its Worldwide Developers Conference in San Jose, Calif. One of the applications was *Consequence*, developed by third-party software maker Glom-Max Associates. The software will distribute a wide variety of medical images for viewing, analyzing and re-formatting data. Apple is also working with 50 third-party developers to create ISDN applications for the Macintosh.

U.S. Robotics acquires modem maker

Modem maker U.S. Robotics, Inc. last week acquired the assets of Touchline Systems, Inc., the Northport, N.Y., manufacturer of the Worldport packet modem. U.S. Robotics, based in Shalin, Ill., said the acquisition will give it a product for portable computer users, rounding out its desktop and data center offerings. Touchline became the Portable Products Division of U.S. Robotics, two co-founders have become U.S. Robotics officers, and the unit will continue to operate from Culver City, Calif. Terms of the purchase were not disclosed.

Current price is down

IBM said it is offering, for a limited time, a \$129 price on Version 1.3 of *Corvus*, its personal information manager package. Customers must order directly from IBM before Aug. 31. Current list for \$295.

Novell enhances server

Novell, Inc. announced that it is shipping its Network Access Server Version 1.2. Access servers give as many as 16 remote users dial-up access to a Novell network. With the new version, users are, for the first time, able to move native Apple Macintosh files over the remote link, as long as Network for Macintosh Version 3.0 is loaded on the network. It also allows remote users to connect with X.25 networks without a separate translator device. The server sells for \$2,595.

CA spins off banking software

Computer Associates International, Inc. spun off its Inland banking software product line last week and merged it with banking outsourcing vendor The Newtrend Group for sale under the Newtrend name. According to CA Chairman and Chief Executive Officer Charles B. Wang, Inland software is in use at more than 700 financial institutions. Newtrend provides financial institutions with outsourcing and computer services through the use of its *Miner/2* software. CA will own half a share in Newtrend, with Wang becoming chairman of the group and R. E. King, chairman of Newtrend, becoming president and chief executive officer of the joint venture.

Genetic privacy bill introduced

U.S. Rep. John Conyers Jr. (D-Mich.) has introduced legislation that would regulate the collection, maintenance, use and dissemination of genetic records held in the information systems of federal agencies and contractors. Conyers, concerned about discrimination against individuals on the basis of their genetic predisposition to certain health problems, said federal privacy laws must be extended to protect genetic records from disclosure and misuse.

Sprint, AT&T win Kuwait contracts

U.S. Sprint Communications Co. and AT&T announced contracts last week to help restore domestic and international telecommunications in war-torn Kuwait. Sprint International will install a satellite earth station to connect Kuwaiti businesses with Sprint's data, electronic mail, voice and video networks, but terms of the contract were not disclosed. Sprint will also open three business centers in Kuwait, each equipped with telephones, fax machines and computer workstations. AT&T said it has delivered two digital telephone exchanges and a satellite earth station to Kuwait under a \$7 million contract.

More news shorts on page 140

HP profit brightens gloomy industry

BY NELL MARGOLIS
CH STAFF

PALO ALTO, Calif. — A varied product mix, a quick takeoff for its new RISC workstations and expense control helped Hewlett-Packard Co. to double-digit revenue and profit increases for its second fiscal quarter.

Perhaps the best news about HP's rebound, analysts said last week, is that it could have staying power.

HP said last week that for the quarter ended April 30, net income was up 35% from that in the comparable quarter in 1990 to \$233 million, on revenue of \$3.7 billion, a 13% increase over last year.

Overall orders rose by 9% over those logged in the firm's

second quarter of fiscal 1990. U.S.-based revenue for the quarter increased by 4% year over year, while non-U.S. sales marked a 20% gain.

Expense control

HP has "done a superb job of getting their expenses under control, and it has worked," said Robert Herwicz, an analyst at Hambrecht & Quist, Inc.

Furthermore, "with their year-to-year orders and revenue growth being somewhat better than IBM's or DEC's, it's pretty clear that when we finally get to an economic upturn [nationwide], HP is going to be exceptionally well-positioned to participate in the growth areas of the '90s," Herwicz said.

Other analysts agreed. Laura

Conigliaro, who follows HP for Prudential Bache Research, Inc., noted HP's mounting strength in the German market and the stronger-than-expected initial demand for its recently introduced reduced instruction set computing (RISC)-based workstations as encouraging.

HP is not necessarily home free, however. Competition from agile, young personal computer vendors that come armed with a mastery of the dealer channel could be fierce for HP, Herwicz said. "They're under attack by the Dells and ASTs of the world." Additionally, encroaching recessionary conditions in Europe are likely to knock a few points off HP's international sales growth in the third quarter, Conigliaro said.

Price war

FROM PAGE 1

hampered by recession and retail consolidation, aim at escalating price war that already involves several vendors. Dell Computer Corp., Compaq's close arch rival, said last week that it will pare prices on desktop and portable models.

A price war in times of economic adversity benefits users in the short term. However, side effects and direct results of price wars — dealer shakeouts, consolidations and weakened vendors with less to spend on research and development — can come to haunt users.

"I'm worried there could be a disadvantage [to the price cut]: I'd like to see Compaq have a lot of R&D cash," said Richard Marolt, information services manager at Great Central Insurance Co. in Peoria, Ill.

Support suffers

The consolidations can be chaotic and limiting, according to Robert McLoughlin, assistant vice president of microcomputer procurement at New York Life Insurance Co. With sales drying, merging dealers will not retain all of their staff members and sites. "There may not be as many people for support or as many convenient locations," he said.

New York Life has been buying PCs and telephone technical support solely from Businessland, which chilled the industry last week with the announcement of a \$43 million loss. Only last-minute credit arrangements seem to have kept the reseller from bankruptcy.

As buyers of lower cost machines choose other sources, such as superstores and mail-order vendors, traditional dealers are hurting.

"The guy that might have gone to Businessland is now

looking at a Gateway catalog or going into a Compaq store," said Will Fastie, editor of "The Fastie Report" in Baltimore.

Less dramatic, but maybe more insidious, is the rise of high-flying Compaq. The vendor blamed its revenue trouble on dealer fluctuations overseas, its recent price cut and dealer consolidation.

Blame the economy

However, the chief culprit is the economy, which is slowing corporate purchases.

"The corporate investment for PCs is down considerably across the country," said Steve Lutz, chief PC analyst at Dataquest, Inc. in San Jose, Calif. "That would impact the premium brands first because they represent a more significant investment level."

For example, Tomson, Md.-based Bell & Decker Corp.'s PC budget shrunk by as much as 10% compared with last year, said Greg Paries, manager of cli-

ent information services.

This tightfistedness has already been felt by IBM, which blamed recent market share declines on the weak war and the recession. Now, Compaq is forecasting trouble.

So far, the low-priced clone vendors are continuing to do well, picking up defector business at the expense of premium brands. Whether they will continue to dominate remains to be seen, but depends on how far the premium brands are willing to cut and how much margin flexibility the clone makers have.

Dell added its own volley to the escalating price war last week by cutting prices \$100 to \$900 on one desktop and laptop systems. This comes one month after Compaq's dramatic price cut and the more recent and limited responses from AST Research, Inc., Toshiba Corp., IBM and Leading Edge Products, Inc.

Another source of industry stress is the recent consolidations among major PC dealers.

Apple considers layoffs

BY JAMES DALY
CH STAFF

CUPERTINO, Calif. — Apple Computer, Inc. employees may become victims of success. High sales of low-cost Macintosh personal computers have cut back profit margins and reportedly led Apple executives to consider layoffs. Published reports last week said as many as 2,000 employees, or nearly 13% of Apple's work force, could be furloughed.

"It's no longer a question of if, but how many people will go," said James Weil, an analyst at Soundview Financial Group. Apple executives briefed securities analysts last week about plans to reduce operating costs, about which they said "they will leave no stone unturned," Weil said.

Last October, Apple unveiled the Macintosh Classic, Macintosh IILX and Macintosh IISX. The success of the machines helped unit sales for the quarter ended March 31 soar 85% over figures from one year earlier, but profit margins had dipped from 54.7% to 45.8%.

Apple spokesman Christopher Bacher would not speculate on layoff plans but said the \$5.56 billion firm is considering several measures to reduce expenses.

A report in last week's *San Francisco Chronicle* said no final decision had been made as to how many of Apple's 15,600 employees would be let go, but estimates ranged from 600 to 2,000. A final decision on the extent of the cutbacks is expected later this week.

FASTEST EVER BENCHMARK. 425 tpsB

On March 12, Oracle® recorded the highest TPC Benchmark® B rate ever: 425 tpsB on a VAXcluster. And the fastest TP1 score ever on January 21st: 416 tps on an IBM-compatible mainframe.

Both were industry-standard tests on 8 gigabyte databases, independently certified by Codd & Date.

All this is further proof that ORACLE not only runs virtually everywhere, it runs fastest everywhere. Fastest on PCs, workstations, minicomputers and mainframes. Fastest on standalone machines, or in a client/server configuration.

So no matter what system you choose, you get the best performance and lowest cost per transaction. No small concern to managers trying to squeeze the most out of their MIS/DP budgets.

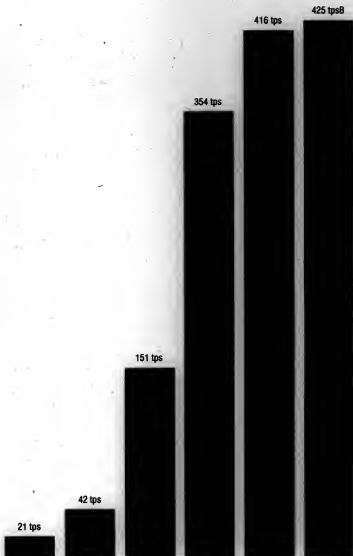
1-800-633-1071 Ext. 8116

But don't just take our word for it. Call, and ask for the benchmark reports audited by Codd & Date. They certify the test results and give a full account of the testing methodology and system configurations.

Just the thing for a little speed reading.

ORACLE®

Software that runs on all your computers.



System 7.0

FROM PAGE 1

random-access memory. Beta-test users noted, however, that the 2M-byte figure is artificially low, and those who want to run more than one application at a time will need at least 4M bytes.

"You can't do much with 2 meg," said Rick Christensen, manager of administration and technical support at Manville Corp. in Denver. "Memory may only cost \$40 a meg, but if you're upgrading a couple hundred IBM-byte machines, you're talking about a significant price tag and a headache to boot."

Users of older and entry-level Macintosh may also feel short-changed, even if they are willing to pay for a RAM upgrade.

System 7.0 requires a hard drive with 3M to 5M bytes of free space, ruling out its use on floppy-based Macintoshes. System 7.0 will run on any Macintosh Plus or later model with enough RAM and disk space, but only the IIS, IIGX and IIFX have the correct processor configuration to fully exploit the upgrade. Models such as the SE/30, IIX and IICX require the addition of a special coprocessor chip to use the virtual memory features.

Apple officials moved toward assuaging those problems by dramatically slashing the price of both memory upgrade kits and logic board upgrades — up to \$79 for memory kits and \$194 for logic board upgrades.

In larger IS shops, some users objected to Apple's focus on peer-to-peer networking, which they said undermines the compa-

ny's claim that System 7.0 is business-oriented. "Anyone who takes networking seriously doesn't want to do peer-to-peer networking because it lacks backup and security controls," said Rick Marbit, IS manager at Great Central Insurance Co. in Peoria, Ill. "I like to have things on the server, where they can be shared by many people."

Users also need to determine if they have the network hardware required to fully exploit System 7.0. Apple officials said drivers for third-party Ethernet

and general manager of Macintosh software architecture, said some incompatibilities have been discovered, but they affect "a small percentage of Macintosh applications and none of the top 500 packages."

Among the applications that require no tweaking to run System 7.0 are Microsoft Corp.'s Word 4.0 and Excel 3.0, Adobe Systems, Inc.'s Illustrator 3.0, Aldus Corp.'s Pagemaker 4.0 and 4.01 and the entire family of Macintosh products from Claris Corp.



Apple's System 7.0 focuses on peer-to-peer networking

cards need to support AppleTalk Phase 2 at the very least. Other drivers developed without System 7.0 support will work if users turn off the virtual memory feature and there is light network traffic.

Another area of concern is application compatibility. Roger Heinen, Apple's vice president

Apple provides a program that will scan existing programs before System 7.0 is installed and flag potential incompatibilities. The \$99 System 7.0 Personal Upgrade Kit also includes 90 days of free upgrade telephone support; the \$349 Group Upgrade Kit offers 180 days of free phone support.

System 7.0 backers

System 7.0 was the star of the show at last week's announcement by Apple, but any movie director can tell you that it is often a cracklejack supporting cast that makes a production successful. As a result, more than 100 third-party applications offering System 7.0 support were announced along with the new operating system. Few are available immediately, but most are expected by Macworld in August.

Among the firms unveiling packages optimized for System 7.0 were the following:

- Microsoft unveiled an updated Excel spreadsheet, optimized for the new operating system.
 - Supermac Technology announced an update of its Plotpoint Professional graphics package. Plotpoint Professional 2.0 is priced at \$799 and is currently available.
 - Claris unveiled its Claris Resolve spreadsheet. The product will sell for \$399 when it becomes available this summer.
 - Ventura Software, Inc. rolled out an updated edition of its desktop publishing software, Ventura Publisher. The package is scheduled to arrive in August.
 - Software Ventures Corp. announced that it expects to launch its System 7.0-compatible Ventura 4.0 of its Microphone II telecommunication application on July 1.
 - Agfa Corp.'s Cosmographic Division announced the availability of scalable TrueType outline font technology for System 7.0. Agfa officials said they plan to produce 200 TrueType fonts by the end of the year.
 - Bitika Corp. introduced Macintosh 3.1, a file- and printer-sharing system that allows the Macintosh to be integrated into IBM Personal Computer, Unix- and pen-based platforms. Macintosh 3.1 is expected to be available in August.
 - Symantec Corp. officials said its Symantec Activator for Macintosh includes System 7.0 support.
 - WTMaker Co. announced that its Windows word processor application will have a System 7.0 face-lift in the third quarter.
- Other leading developers whose products are compatible with System 7.0 or that have committed to incorporate its features into new products include Ashton-Tate Corp., Lotus Development Corp., Paragon Computer, Inc., Newell, Inc., Aldus and Acme, Inc.

JAMES DALY

IBM taps Borland for OS/2 applications tools

BY PATRICIA KEEFE
OF STAFF

IBM let drop last week the first key piece of a plan to deliver an OS/2 developers' workbench.

IBM announced a nonexclusive agreement under which Borland International, Inc. will develop specific object-oriented programming languages and development tools for the 32-bit OS/2 Version 2.0. The deal complements an upcoming IBM enhancement to the OS/2 software developers' kit.

The developers' workbench for OS/2 will consist of tools from both IBM and third parties, according to John Soyning, director of software development and programming at IBM's Personal Systems Group.

The workbench has been kept under tight wraps and is described as "an entire development environment for applications developers."

The Borland products will be delivered early next year, said Gene Wang, vice president of the applications company.

The first product slated to ship is Borland C++ for OS/2; early release copies will be out by year's end. It will contain a "100%" ANSI C compiler, a C++ compiler that supports object-oriented programming and an object-oriented 32-bit assembler, debugger and profiler, along with a visual resource editing capability that reportedly enables developers to build user interfaces quickly.

IBM chose Borland over others for several reasons, Soyning said. For example, he surveyed third-party developers and uncovered a demand for object-oriented programming tools, preferably in C++.

Moreover, not only has Borland's technology racked up positive reviews, but its sales were also "outstanding," he said.

Users frown at federal regulation of AT&T

AT&T-sponsored study cites concerns with increasing costs, delays

BY GARY H. ANTHES
OF STAFF

WASHINGTON, D.C. — Federal regulation of AT&T harms corporate users by limiting choices, inflating prices and slowing the procurement of telecommunications services, according to 14 large U.S. enterprises probed by the National Economic Research Associates, Inc. (NERA).

Thirteen companies and a university, some of them AT&T customers, said in the AT&T-commissioned research that the high end of the long-distance market is now intensely competitive, and they called on the Federal Communications Commission to create a level playing field for AT&T and its competitors.

Paine Webber, Inc. said regulatory delays cost the company nearly \$500,000 in savings while it negotiated a Thrift 12 package of voice and data services from AT&T. "I see nothing but negative effects from

regulation," said Gerard Higgins, senior vice president for communications and computer services. "I would like to deal with AT&T with no regulation, just like we deal with IBM."

Big delays

Boise-Cascade Corp. reported a 10-month, \$2 million delay in getting its Thrift 12 approved, and AMR Corp. (parent company of American Airlines) said regulatory delays cost it \$1 million per month in lost savings. "I am absolutely sure I would get a better deal if AT&T were more free to compete," said James Juracek, AMR systems engineering vice president at Sabre Computer Services.

The study was part of a \$200,000 consulting assignment paid for by AT&T. AT&T assisted in choosing the companies to be interviewed but had no hand in editing the results, NERA said.

"Any study commissioned and paid for by AT&T is hardly

worth anything," said a spokesman for MCI Communications Corp. A spokesman for U.S. Sprint Communications Co. said Sprint was considering its own study survey on the issue. MCI and Sprint have strongly opposed FCC proposals to substantially deregulate AT&T's business offerings.

Despite the report's strong support for further deregulation, the company testimonial did not always land AT&T.

Paul Parloff, senior director of information services at Georgia-Pacific Corp., said, "One of the things we found in dealing with MCI and Sprint was that anytime we asked a question, the answer was, 'Can do.' Any time we asked AT&T a similar question, the answer was, 'We're not sure; we'll have to go back and see how that will play under the tariff...'"

As a result, Georgia-Pacific has moved most of its telecommunications business from AT&T to MCI.

A recent study of over 4,000 Datamation Magazine subscribers named Oracle Financials as the accounting software they are most likely to buy this year.

Which isn't too surprising, when you consider everything they have to offer.

Oracle Financials are the first complete and integrated family of cross-industry accounting software based on modern relational technology.

In other words, the modern alternative to the ineffective, unresponsive accounting software built in the 1970's.

Whether you're a growing enterprise or a giant conglomerate, Oracle Financials can be quickly configured to do business the way you want. Then altered or extended as your needs change. All without programming.

Oracle Financials are powerful enough to do large-scale, multi-national, decentralized accounting. So large companies can use them in all their international and domestic divisions, subsidiaries and departments. Which means everybody gets the information they need, when they need it. Even headquarters.

Oracle Financials are the first major accounting software with 1-2-3 and Macintosh-like menus. To give your users unprecedented ease of use.

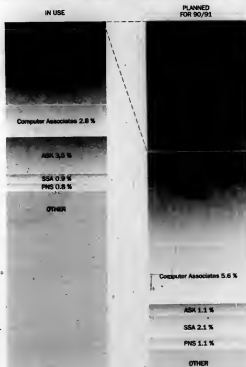
Like all Oracle products, Oracle Financials run on virtually any computer you have today, or will have tomorrow.

On mainframes or low cost minicomputers, workstations and PCs. So you can use the computer or group of

computers that makes the most sense for your company and your budget.

But more than just software, Oracle provides the education, consulting and support services to maximize your success with Oracle technology. In fact, over one-third of the 8,000 people at Oracle are devoted to customer service.

Datamation states "Oracle is the only clear winner" in accounting software.



Call us, and register for the free Oracle Financials Seminar in your area.

1-800-633-1073 Ext-8120

You'll see why Oracle is accounting for all the growth in accounting.

ORACLE

Software that runs on all your computers.

Brands cited when 4,062 Datamation Magazine subscribers were asked "Do you have in use now, or do you plan to use initially in 1990/91, Financial/Accounting software with your minicomputer/workstation system?"

Cincom Systems releases rival to IBM's AD/Cycle

BY ROSEMARY HAMILTON
CW STAFF

Cincom Systems, Inc. launched an alternative to IBM's AD/Cycle applications development environment last week that it said offers more facilities than IBM's and runs on multiple platforms.

Cincom's AD/Advantage has been under development for six years and has recently been marketed in the UK, according to Dennis Butler, the company's director of applications development technology.

The Cincom initiative has some similarities to AD/Cycle. It

addresses the full life cycle of applications development and will rely on existing third-party front-end tools for the design and analysis phase.

It incorporates a number of Cincom software modules, including some new facilities such as the design object generator

that takes data from design tools and produces screen panels and other objects for an application.

Cincom uses a new version of its fourth-generation language, Mantia, as a core piece of AD/Advantage to develop and prototype programs.

Butler said the system will

eventually support IBM's and others' repositories as they become mature.

The company will initially offer AD/Advantage for IBM MVS and VSE users, and it plans to provide a version for the IBM IMS environment later this year.

Cincom also intends to extend AD/Advantage to other platforms, including Digital Equipment Corp.'s platform.

Money woes plague Prime

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. will cut 800 positions in an effort to reduce operating expenses and offset a disastrous financial report.

DR Holdings, Inc. in Delaware, which rescued the ailing Prime from a hostile takeover attempt two years ago, released its first-quarter statement last week, posting a staggering \$84.4 million net loss.

Harvey Wagner, vice president of finance and chief financial officer at Prime, attributed the company's poor showing to continuing weakness in both the worldwide and U.S. economies.

Wagner confirmed that 800 jobs would be eliminated at the company, saying that this would be accomplished through normal attrition. Prime employs 8,300 people worldwide.

"Prime is facing extremely difficult competition in the minicomputer arena in the next 12 to 18 months, especially from companies like IBM and Digital Equipment Corp., who are offering price cuts and performance increases," said William Sines, director of midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass. He estimated that 60% of Prime's business is international.

Riding out the storm

Prime's customers remain confident. "As a user group, we don't think this is any different than what many other companies are going through right now," said Cathy Van Orman, president and chairman of the National Prime User Group.

She said users are confident Prime can "ride out the storm" and pointed to upcoming announcements in the imaging and software arena as proof of Prime's commitment and staying power.

The immediate challenge is to keep on track and maintain focus, according to Wagner.

"We will continue to move from a totally dependent hardware manufacturing company to a software, service and solution company," he said.

THE CONCEPT BEHIND OUR CASE PRODUCT.

System Architect has the power to handle your most complex applications. And it's so easy to use, even beginners will be productive in no time.

"The software's incredible ease of use betrays the power hidden within."
Computer Language

System Architect works with such methodologies as DeMarco/Yourdon, Gane & Sarson, Ward & Mellor (real-time), entity relationship diagrams, object oriented design (optional), state transition diagrams, and flow charts.

"System Architect stood out from many other products because it had the best core technology."
Toshiba Corporation

With System Architect, you get support for an integrated data dictionary/encyclopedia, and multi-user support both with and without a network. And System Architect's open architecture lets you easily import and export data to other products.

"We're surprised with its flexibility and much taken with the idea of being able to link different kinds of diagrams..."
Cutter Information's CASE Strategies

System Architect is a pleasure to work with. It's Windows-based, has context-sensitive help, and a novice mode.

"SA is an excellent value."
CASE Trends

At \$1,395, System Architect is quite affordable. And it runs on almost any PC.

"...truly a price performance leader."
System Builder

For a powerful CASE product that's easy to use and affordable, look to System Architect. It's the right concept for CASE.

FOR MORE INFORMATION,
CALL (212) 571-3434



POPKIN
Software & Systems Inc.
11 Park Place, NY, NY 10007
(212) 571-3434
Fax: (212) 571-3436

**MICROSOFT
WINDOWS**
Note: Not a registered trademark of Microsoft Corporation.

Supporting IBM's AD/Cycle

System Architect logo is a trademark of Popkin Software & Systems Incorporated. IBM is a registered trademark of IBM Corp. Microsoft is a registered trademark of Microsoft Corp. Price shown valid only for USA & Canada. Prices and specifications are subject to change without notice at the sole discretion of the company. Product delivery subject to availability. Please call for the names of the nearest international distributors.

System Architect

Finally, The Promised LAN

Oracle Client/Server Systems are open, portable, integrated. And here.

Oracle's integrated family of products lets you take everything you've read about client/server systems in the magazines and put it to use in the workgroup. Combining the economy and flexibility of PCs with the performance and integrity that used to require a mini at the very minimum.

ORACLE is portable. Giving you the widest choice of desktop servers: OS/2, six different UNIX systems and shortly, both Netware and Macintosh. ORACLE also lets your existing minis and mainframes act as servers to desktop machines.

ORACLE works with all your existing networks. Or any networks you'd like. Novell Netware 286/386, IBM LANserver, Microsoft LAN Manager, Banyan VINES, TCP/IP, and many others.

And it goes without saying that because ORACLE is open, it supports all the front running front-ends. Including Paradox, Lotus 1-2-3, even Dbase applications.

Or you can develop your own client applications with Oracle's integrated set of development tools. Including a powerful 4GL, screen generator, report-writer and menu generator.

But more than just software products, Oracle provides all the support services to fully transfer client/server technology to you. These services, combined with ORACLE software products, guarantee your technology investment.

1-800-633-1073 Ext. 8119

Call for more information, or to register for an Oracle Client/Server Forum. You've been stuck in never never LAN long enough.

ORACLE®

Software that runs on all your computers.

ORACLE SERVER
FOR OS/2

ORACLE SERVER
FOR VINES

ORACLE SERVER
FOR PC UNIX

Excel

Paradox

ORACLE Tools

Lotus 1-2-3

Dbase

ORACLE CASE

AutoCAD

SQL*Forms

Orma 5

HyperCard

4th Dimension

Microsoft, AT&T only players on Unix LAN Manager team

BY JIM NASH
CW STAFF

Microsoft Corp. and AT&T Computer Systems last week became the sole developers of Microsoft's LAN Manager network operating system for Unix after Hewlett-Packard Co. bowed out of the two-pronged development effort.

Mike Murray, general manager of Microsoft's networking business unit, said in a teleconference last week that he ex-

pects Version 2.0 code for Unix to be available to OEMs in the fourth quarter of 1991. Managers juggling LAN Manager and Unix workstation networks have been stuck with Version 1.1.

Industry analysts predicted that end users would see new products in about 18 months. Murray said both Microsoft and AT&T will make certain future versions of LAN Manager will be grafted onto LAN Manager for Unix with "maybe a couple months' lag."

HP will continue to support its version of LAN Manager for Unix, but from now on, the firm will resell AT&T's version. The AT&T product is generally regarded as the more sophisticated, said Craig Burton, a principal at consultancy Clarke Burton Co. in Salt Lake City. HP announced separately that it will offer worldwide support for Microsoft's LAN Manager, Windows, MS-DOS, OS/2 and SQL Server products.

According to Don Sherwood, a product marketing manager at HP, the company is comfortable with the role of reseller and integrator now that the product, "is more stable and more of a commodity."

An AT&T spokesman said the new development agreement "requires maximum portability" to new and existing

OEM versions of LAN Manager for Unix.

Network administrators said they had few qualms about the consolidation, as long as all OEM versions worked well with AT&T's. Brenda Blowers, a computer specialist and facilities manager at China Lake Naval Weapons Center in China Lake, Calif., said she is comfortable with the changes. "As long as the code is compatible," Blowers said, "I don't see where there will be an impact" on our networks.

Cost concerns

Other users agreed but expressed concern about the cost of migrating from their systems to AT&T's. No prices for future versions of LAN Manager for Unix have been released.

Harry Vanderholst, information systems manager at Dreessen Aircraft Interior Systems, Inc. in Oceanside, Calif., said he might not migrate from the HP software he uses now, especially if the price is too high.

Microsoft comes closer to attaining its goal of a single common LAN Manager platform. In most network market share pie charts, Microsoft's portion often includes many licensed versions. Murray said the company is working to eliminate the notations to that effect.

Late last year, Microsoft was successful in regaining LAN Manager code from 3Com Corp., maker of the 3+Open network operating system. With the consolidation of LAN Manager for Unix, the only non-microsoft version of LAN Manager available will be IBM's LAN Server. Plans are under way to bring LAN Server into closer profile with LAN Manager.

HP will adapt to Windows OLE

BY J. A. SARGE
CW STAFF

In a move that could leverage hundreds of applications into Hewlett-Packard Co.'s New Wave personal computer application, HP announced that it will support future releases of Microsoft Corp.'s Windows that include Object Linking and Embedding (OLE). Currently, applications that take full advantage of New Wave have to be specifically ported to New Wave.

OLE is object-oriented code that allows two separate applications to be mixed. New Wave does much the same thing but also automatically updates changed files. In addition, it has a mechanism that automatically performs routine tasks in one file or several.

"Since Microsoft will be requiring developers to redo applications to apply to Object Linking and Embedding, then we'll do the rest," said Richard Walker, marketing development manager for New Wave.

He said that currently Windows applications can be run in New Wave without a specific port, but text and graphics from different files cannot be manipulated by "drag and drop" methods — a function analysts have said is one of the most desirable parts of New Wave.

No availability date has been set for HP's OLE support because it is dependent on Microsoft's delivery of its Windows code. "Microsoft is only now shipping preliminary beta code," Walker said.

Thinking About EIS? Think Twice.

EIS II

It's estimated that more than half of today's Executive Information Systems fail*. So if you're thinking about installing a traditional EIS, think twice.

EIS II is the new generation of Executive Information Systems. It's more than just an electronic "slide show". It's a blueprint for integrated end-user computing, providing true analysis and issue management for executives, managers and staff across your organization.

Only Express/EIS® from Information Resources gives you the power of EIS II today. On standalone PC, LAN or mainframe. You get full data integrity, end-user flexibility, cooperative processing and worldwide support.

Express/EIS Delivers:

- Common graphical user interface (GUI)
- Smooth integration of tracking, analysis and issue response
- Intelligent exception reporting and drill-down on "live" data
- SQL access and transparent links to corporate data
- Rapid implementation
- Low maintenance and support costs

For a free EIS II Information Kit, call 617-890-8717 (416-221-2100 in Canada).



information
resources

*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Uses," ©1991 Express/EIS is a registered trademark of Information Resources, Inc.

How Sybase Keeps Transportation On Track.

Today, SYBASE is at work throughout the transportation industry.

From American Airlines to Mitsui/O.S.K. shipping lines to the CSX railroad, industry giants depend on Sybase Open Client/Server Architecture to bring applications on-line within multi-vendor, multi-platform environments.

CSX chose SYBASE when they needed an RDBMS with distributed computing capabilities to handle system-wide order processing for shipments worth some \$5 billion a year.

In less than a year, SYBASE helped CSX slash more than \$1.5 million from its operating costs. And helped streamline its order processing into a cost-efficient operation capable of easily handling 10,000 orders a day.

With its high performance and enterprise-wide capacity, SYBASE handles thousands of customer orders received on paperless PC faxboards, stored on minis, processed on Macs, and invoiced from mainframes. SYBASE gives CSX the ability to track and manage the entire process in full detail. And SYBASE open interoperability even lets CSX automatically utilize space-saving optical storage for government-required order archives.

What's more, with its high application availability, SYBASE helps CSX provide around-the-clock customer service. Because backups, recoveries, diagnostics, transaction logic, and integrity changes all take place while applications are running.

Today, SYBASE runs on a wide range of computing platforms including MVS, VMS, UNIX, and OS/2, with DOS and Macintosh connectivity. And for complete information planning and application development services, our professional services division, SQL Solutions, designs, develops, and integrates relational systems for on-line, enterprise-wide computing networks.



To find out more about SYBASE, just catch a free Sybase Educational Seminar.

Call 1-800-8-SYBASE for the seminar nearest you.



SYBASE

Client/Server For The On-Line Enterprise

For more information or seminar reservations, call 1-800-8-SYBASE.

© Sybase, Inc. 1991. Other company or product names may be service marks or trademarks of their respective companies.

Harvard takes to Windows

BY CAROL HILDEBRAND
CW STAFF

MOUNTAIN VIEW, Calif. — A major upgrade of Software Publishing Corp.'s Harvard Graphics presentation software drew a reaction of "It's about time" from industry observers, but they were more skeptical of a Windows version of the package. Both were announced last week.

"The upgrade has been long overdue," said Jeffrey Tarter, editor of "Softletter," a newsletter based in Watertown, Mass.

Harvard Graphics 3.0, which is expected to be available next month, represents

an effort to more tightly integrate the charting, drawing and presentation functions as well as to deepen the drawing and charting environment, said Ted Simoni, Software Publishing's product manager for 3.0.

Users singled out the revamped drawing environment. "It's much easier to integrate your drawings with your charts now," said Carol Langston, a personal computer software analyst at The Hertz Corp. The drawing capabilities are now totally built into the package, she added.

The icon-based drawing environment has also become handier for moving text

around, said Bob Morley, systems analyst at MCI Communications Corp. "As far as moving the text around that you'd already put in a chart, it used to be kind of kludgy. Now, it's a lot easier to deal with."

The announced Windows version, which the firm said would be ready sometime between November 1991 and February 1992, is going to be a harder sell, since the DOS-based product's estimated base of 750,000 users will have to learn a new product once they move over to Windows-based versions.

While Langston, whose firm is moving to Windows on the low end and going to OS/2 on servers, said it will "more than likely" switch to Harvard Graphics for Windows, others were not so sure.

"Once people are switched over [to

Windows] and don't have to use Harvard, it's going to come down to how good a job Harvard salespeople do convincing users to stay with Harvard," said William Cogshall, president of New Media Research, Inc., a Los Altos, Calif.-based market research firm. "As it goes, so go the fortunes of Software Publishing."

Europe LAN routing pledge

BY ELISABETH NORWITT
CW STAFF

EL SEGUNDO, Calif. — Infolnet Services Corp. introduced a service last week called Infolnet, which is said to provide geographically distributed local-area network users with the response time they demand without requiring that their companies set up and manage international leased-line networks.

The service is based on Caco Systems, Inc.'s routers installed at Infolnet hubs, enabling the carrier to route LAN transmissions over a shared backbone at speeds of up to 2M bit/sec.

For a set price, Infolnet will provide, manage and maintain its own backbone links, the local Postal Telephone and Telegraph authorities' leased lines and Caco routers at the user's premises, said Infolnet spokesman Robert Sheikh.

Kredietbank N.V. in Brussels, for example, is installing the network to handle backup and traffic overflow for an existing private LAN-to-wide-area network that is based on Caco routers. "We wanted more redundancy on our network, especially the Asian branches," company spokesman Peter Van Lier said. In Asia, it can take eight or more months to install a backup leased line, and it is difficult to ensure that the two lines do not run over the same facilities.

Filling the gap

Infolnet fills a gap in the current European networking environment, where X.25 services are ubiquitous but too slow for many LAN users, and leased lines are not always easy to come by, according to Doug Gold, director of communications research at International Data Corp. in Framingham, Mass.

Infolnet needs to expand the service beyond its current limitations, Gold said. The initial service, scheduled to be launched next month, will serve only nine countries, including the U.S. Infolnet said it plans to add Canada, Hong Kong and Japan in the fourth quarter and Australia and Denmark early next year.

Infolnet is also limiting the protocols Infolnet will initially support to Token Ring and Ethernet LANs and Transmission Control Protocol/Internet Protocol and source-routing protocols. Missing are IBM's Systems Network Architecture and Novell, Inc.'s IPX, Gold said.

Infolnet plans to add support for IPX as well as Digital Equipment Corp.'s Decnet to Infolnet early next year, Sheikh said.

Pricing for Infolnet depends on configuration. An implementation that connects LAN sites in San Francisco, Tokyo, Hong Kong, London, Paris and Brussels and supports links of up to 64K bit/sec. between the user premises and Infolnet would cost \$25,000 per month.

Imagine A Tool This Right For The Job.



Imagine NOMAD.

For every job, there is a perfect tool for getting it done faster, with less effort. When it comes to accessing data for reporting and decision support, NOMAD is that tool.

NOMAD's richness and versatility allow you to satisfy a full range of requirements. From simple queries to highly sophisticated modeling and analysis, its syntax-free reporting gives users the ease of working from cascading point-and-pick and pull-down menus. NOMAD's developer's tools make application design and customization faster and easier than ever before. And there's even an icon-based tool for delivering cooperative

applications with a graphical user interface under Microsoft Windows.

Tap into the power of NOMAD for transparent access to relational databases across platforms—DB2, DEC's Rdb/VMS and LAN servers, like SQLBase and SQL Server. No need to worry about where data is stored or how to get at it. With NOMAD, you're free to concentrate on making the best use of your data for decision-making.

To see just how right NOMAD is for every job you can imagine, call MUST Software at 1-800-441-MUST.

Imagine NOMAD. Imagine the Possibilities.

MUST SOFTWARE
INTERNATIONAL
Member Thompson Information Technology Group

*NOMAD is a registered trademark of M. International Ltd. *NOMAD and its hardware and software products are registered by their trade names. In all cases, any designations are claimed as trademarks by their respective companies.

THE ILLUMINATION YOU NEED TO UNLEASH THE HIDDEN POWER OF DB2.



Without the right tools, it is almost impossible to observe what's going on inside DB2. Inside the black box. As a result, tasks that should be being handled by various maintenance groups are consuming precious DBA resources.

That's why Candle offers a complete set of tools to illuminate DB2. Tools that observe problems based on your exception thresholds. Isolate the root cause of problems. And automatically fix problems or recommend speedy solutions.

Using Candle's tools, day-to-day Catalog

activities are simplified and automated. Overallocated DASD space is reclaimed. Time spent running reorgs and image copies is reduced. Poor-performing SQL is isolated and explained. And performance and service levels are easily monitored.

By simplifying and automating such time-consuming tasks, Candle's tools allow these tasks to be delegated to the appropriate groups, freeing the DBA to unleash the hidden power of DB2.

Candle

See us at IDUG Booth #301



FREE ILLUMINATOR KIT

To become more enlightened about how Candle's powerful tools can streamline DB2 management and

administration, send for your free Illuminator Kit today. Complete the coupon and mail to Candle Corporation, 1999 Bundy Drive, Los Angeles, CA 90025. For faster service call 800 843-3970, Dept 406.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

D&B Software duo unites user groups

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — The normal user group talk of upcoming releases and support issues may take a back seat at this year's Interact conference.

The 4,000 customers of for-

mer Management Science America, Inc. will focus on next year's merger of its user group and the former McCormack & Dodge user group into one entity under the Dux & Bradstreet Software flag. The move mirrors last year's merger of the two vendors into D&B Software.

"There are 10,000 companies using D&B Software in the U.S., and most users will benefit from the joining of the two," said Dale Sietsema, a member of the task force assigned to the merger. Sietsema said he is not looking for any "product answers" at this year's meeting and that he is

comfortable with the vendor's stance on product direction.

D&B Software is making a push toward the client/server software model, although no products have been delivered and no official migration plans have been mapped out.

"I would like to know the extent of this migration as well as the time frame," said Katharine Souman, chairwoman of the In-

teract government and industry special interest group. "Are we talking five years? Ten years?"

Strategy in itself

Hank Holland, president and chief operating officer at D&B Software, stressed that the future architecture is a strategy.

"We want to clearly communicate both the technical and customer sides of this strategy," Holland said, adding that D&B Software will continue to support both product lines.

Holland said he will detail company plans at Interact. "I think our biggest hurdle to overcome is educating the user in terms of client/server. A lot of mystique is associated with that particular buzzword, and we have to remove that."

U.S. maps out technology

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — By the year 2000, a single semiconductor chip will be able to hold more than 1 billion bits of information but will require a factory costing between \$1.5 billion and \$2 billion to make, the National Advisory Committee on Semiconductors (NACS) said last week. Only 10 superchip manufacturing lines will be needed, and fewer than five will be in the U.S.

The predictions are part of a "technological road map" by which the U.S. semiconductor industry hopes to leapfrog past foreign competition by the end of the century. It was put together by 90 experts at a workshop convened last month by NACS and the White House Office of Science and Technology Policy (CW, April 29).

Smaller chips

One goal of the program, called Micro Tech 2000, is to help U.S. industry develop a 1G-bit static random-access memory chip by the year 2000. That will require chips with features .15 micron wide — or five times smaller than those in today's best chips. Achieving those goals would put the U.S. about three years ahead of the Japanese, said Ian Ross, chairman of NACS and president of AT&T Bell Laboratories.

The difficulties in meeting the goals will "force a new culture of cooperation and sharing within the U.S. and the world semiconductor industry," a NACS summary of the road map said.

Robert Galvin, chairman of the executive committee at Motorola, Inc. as well as chairman of Sematech, said there is enthusiasm for such cooperation. "Companies are finding they don't have as many secrets to protect as they have common interests."



Your business is safe with us.

Through all of its ups and downs.



We'll help you keep your business rolling. With our 4 megabyte diskettes and 3M Megamag 135 data cartridges you have a whole new generation of data storage media for high capacity systems. So, whatever format or capacity your data is stored in, we're ready when you are.

That's why more business protects important information on 3M brand diskettes and data cartridges than any other brand in the world. Call 1-800-888-8889 ext. 4 to find out more.

Innovation working for you™

3M 
Worldwide Sponsor 1992 Olympic Games
© 1991 3M

Diskettes and data cartridges require compatible drives. © 1991 3M
Megamag is a trademark of 3M

Executive

Finance

The Most Comforting Reason Yet to Choose UNIX.

The world's leading applications system has arrived on leading-edge UNIX workstations.* Bringing with it the same integrated applications that have made SAS software such an indispensable part of the corporate mainstream. And that's a very comforting thought if you're using or evaluating UNIX.

Manufacturing

Supply Chain Management

Marketing

The SAS® Applications System Welcomes UNIX® to the Corporate Mainstream.

A Familiar Name, A Friendly Face

The SAS System helps UNIX do what UNIX does best. It's never been easier to exploit all the price/performance advantages of UNIX...or to connect UNIX with other systems throughout your organization. That's because the SAS System's powerful data access, management, analysis, and presentation tools work the same way on UNIX workstations as they do on host machines.

A menu-driven user interface takes you directly to the SAS System's most popular applications. We've also taken full advantage of UNIX native windowing. Plus, we've added new interactive capabilities for visual data analysis.

Research and Development

And a Risk-Free Offer

Let the SAS System be your link to strategic computing resources throughout your organization. Give us a call now at 919-677-8200 or fax us at 919-677-8123. We'll rush you a

free SAS System executive summary, together with details about a no-risk software evaluation. In Canada, call 416-443-9811.

**The SAS® Applications System.
Simply Powerful. Powerfully Simple.**



SAS Institute Inc.
Software Sales Department
SAS Campus Drive □ Cary, NC 27513
Phone 919-677-8200 □ Fax 919-677-8123

*From IBM® DBC, Sun, HP, and others.

The SAS System runs on mainframes, minicomputers, workstations, and personal computers. SAS is a registered trademark of SAS Institute Inc. UNIX is a registered trademark of AT&T. Copyright © 1991 by SAS Institute Inc. Printed in the USA.

People are always looking for
affordable ways to make a better impression.



Soon a lot more people will be looking their best. Because now the best features of the HP LaserJet III printer are more affordable.

The new LaserJet IIIP printer features HP's exclusive Resolution Enhancement technology. An innovation that provides 300 dpi print quality superior to that of ordinary laser printers. The PCL5 printer language, with font scaling and HP-GL/2, brings even more to your documents. Fourteen bit-mapped and eight

internal scalable typefaces give you thousands of options. And, to make things even more interesting, the LaserJet IIIP produces patterns, shading, spirals, and mirror images. In portrait or landscape.

HP has picked up the throughput speed of this 4 ppm printer. Due to a considerably faster I/O rate, the LaserJet IIIP accepts data as quickly as your PC can transfer it. So you not only get your output faster, you get your screen back faster. The LaserJet IIIP also has

a new 16 MHz processor and PCL5 for on-the-fly typeface scaling and fast vector graphics. These

DIAGNOSIS



Tell them about the new LaserJet IIIp



advancements mean this compact printer requires less time to print than many laser printers with higher ppm rates.

For versatility, the LaserJet IIIp has a multisized paper tray that accepts various sizes of paper and envelopes. An optional Adobe® PostScript® cartridge is available. And, of course, the LaserJet IIIp is compatible with all major software and HP LaserJet accessories.

The good looks you get with the newest HP LaserJet look even

better when you consider the price. Just \$1,595.* For a faxed data sheet, dial (208) 344-4809 from your FAX machine and enter document I.D. number 9601. Now everyone can add a little polish to their work.

HP Peripherals
When it's important to you.



**HEWLETT
PACKARD**

ADVANCED TECHNOLOGY

TECH TALK

Spaced-out VAX

■ On its recent flight, the space shuttle Discovery carried into orbit a specially designed Digital Equipment Corp. VAX as part of a National Aeronautics and Space Administration test of commercial computer software. A militarized VAX 6000 successfully controlled from space a robotic system at the Goddard Space Flight Center in Greenbelt, Md. The test verified that standard VAX commercial architecture and software — VMS and Ada language — can be used in the harsh environment of space, according to DEC. The computer was modified to resist the rigors of space travel, including the stresses of rocket launch and extreme temperatures.

Light and lacy

■ A team of British researchers has discovered a way to make silicon emit light. The finding is a potentially significant step in the development of optical computers. The researchers at the UK Ministry of Defense's Royal Signals and Radar Establishment in Lavers, England, etched holes into silicon and created "porous silicon" that has unique optical properties. The lacy silicon structure may pave the way for optoelectronics based on silicon, which is inexpensive compared with gallium arsenide and other materials with light-transmitting capabilities.

Epads, a 16M-bit EPROM

■ Toshiba Corp. recently began shipping samples of its 16M-bit erasable programmable read-only memory (EPROM). It is the world's largest capacity EPROM, according to the company. The new device has an access time of 150 nsec and is expected to be used mainly in the design of telecommunications and medical equipment, laser beam printers and word processors. Data stored in the EPROM can be readily erased by exposing the device to ultraviolet light, which makes it useful in developing prototype equipment.

Audio: The wave of the future

Speech, a more natural mode of communication, will be the future's interface of choice

BY MICHAEL FITZGERALD
OF THE

Graphical user interfaces are all that anyone talks about these days, but audio user interfaces will be the favored technology in the future, some scientists believe.

"Human interaction through computers happens through a keyboard and monitor — both are fairly unnatural," said Joseph "Chip" Krauskopf, manager of the advanced human interface group at Intel Corp. "Everyone is comfortable communicating through speech."

Although it is not certain that Hal — the talking computer in Arthur C. Clarke's 2001: A Space Odyssey — will have arrived when 2001 rolls around, computers that talk and listen have begun to leave the realm of science fiction during the last few years.

Creating Hal "is really a hard one — Hal not only had speech recognition abilities, but also read lips," explained Krauskopf, who said creating a computer with the ability to process natural language remains an immense challenge. "We're just now at the beginning of doing good speech recognition, and further away still from natural language processing," Krauskopf said.

Computers with speech recognition capabilities are on the market today.

Dragon Systems, Inc., for example, markets a discrete speech recognizer with a 30,000-word vocabulary for personal computers (in discrete speech,

speakers must pause between each word) and a continuous, or normal, speech recognizer with a 2,000-word vocabulary. The user, "teacher," the machine to recognize his unique speech pattern by speaking.

At Rank Xerox's Europarc research center in Cambridge, England, signifi-



Any Research

cant pieces of an audio interface are in use today. Before meetings, the computers on the participants' desktops begin to generate the sounds typical to a meeting: Voices murmuring and papers rustling cue attendees that the meeting is about to begin. Europarc also has what it called a "Sonic" version of Apple Computer, Inc.'s Finder. With Sonic Finder, if a file is dumped in the trash can, it makes a "thunk" sound.

"It's not something people are just talking about," said Sara Bly, research scientist at Xerox Corp.'s Palo Alto Re-

search Center, in Palo Alto, Calif.

"[The audio interface] absolutely could start showing up in everyday life before the end of the decade."

Bly's own research focuses on ways to use nonspeech audio in exploratory data analysis, a statistical method used to differentiate data when it is not clear what you might want to get from it.

One possible use is to analyze patterns in the stock market. The output would be both graphical and aural: The computer could conceivably play a melody that could indicate patterns a graph alone could not.

Computers with multimedia talents, such as the Next workstation made by Next, Inc., are able to receive and deliver electronic voice messages and permit executives to attach verbal notes to reports.

That sort of verbal Post-it Note also is offered by Articulate Systems, Inc., which sells a product called Voice Navigator II for the Apple Macintosh. Interactive, Inc. in Montrose, S.D., recently introduced a similar product called Interactive Sound that it calls a voice mail software package. Interactive Sound runs under Microsoft Corp.'s Windows 3.0 when used with a Creative Labs Sound Blaster Board.

A number of practical concerns must be resolved before Hal becomes reality. A two-minute, phone-quality conversation takes up 1 MB of random-access memory, and one minute of compact disc-quality sound would consume 5.2 MB of hard disk space unless it is compressed.

When system glitches are cosmic — seriously

BY CAROL HILDEBRAND
OF THE

Cosmic rays caused the system crash. "That may become the strangest excuse yet for systems programmers as a result of a study being conducted by scientists at Los Alamos National Laboratory in Los Alamos, N.M."

The study, an informal effort involving several Los Alamos scientists and computer division staffers as well as a representative from Cray Research, Inc., is examining the possibility that unscheduled individual bit failures in memory among supercomputers may be the result of cosmic ray showers, a phenomenon that has been well-documented among computers aboard

spacecraft but has remained unstudied for terrestrial machines.

As supercomputers grow in complexity, they are able to record individual bit failures in memory as a function of time, explained Jim Tabor, the study's administrative coordinator.

Taking aim at cosmic events

Tabor said the study is aimed at correlating the bit failure data of the Cray supercomputers with particular cosmic events, such as Superstorm 1987A, which was recorded in January 1987, to see whether there was a corresponding jump in bit failures at the time of the event.

Solar activities, such as flares, emit tiny energy-carrying particles, called neutrons, which generally pass through the earth and its atmosphere

without distraction.

"The atmosphere serves as a shield to protect the earth from most solar cosmic ray activity," Tabor said, adding that there have been only about 50 solar events significant enough to be measurable at earth's surface during the past half century.

The increasing power of supercomputers could also make them more susceptible to cosmic activity, Tabor said. "As chips get smaller, they become more sensitive to neutrons."

Tabor said the group is looking into collaborating with other ray sites around the world to examine the impact of such geographical data as altitude. "We'll be looking at whether there's any regularity with the bit failures," he said. For example, "Do they happen more at nighttime? At noon?"

Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems?

Informix.



IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.



About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, every one of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

► New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

► The Number 1 Choice for UNIX OLTP

Informix is the number one UNIX OLTP choice. A January 1991 International Data Corporation (IDC) study shows that when it comes to UNIX OLTP applications, Informix products are installed at more than twice as many multi-user UNIX sites as our closest competitor. It's independent confirmation that thousands of companies worldwide rely on Informix-based OLTP solutions every day.

► A Decade of Innovation

Informix has been a UNIX RDBMS technology leader for over 10 years. Continuous innovation has resulted in advanced application development languages, distributed client/server computing, gateways to other computing environments, and multimedia flexibility you can take advantage of today.

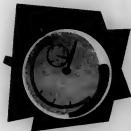
► Find Out More

We'd like to send you benchmark specifics—and information about how Informix products can meet your data management needs.
Call us toll free: **1-800-688-IFMX, ext. 2.**



INFORMIX-OnLine Database Server

OnLine was built for speed...and that's what it delivers. Developed entirely on UNIX, the OnLine server turns in optimum performance on every popular UNIX architecture—including symmetric multiprocessors, RISC, and CISC.

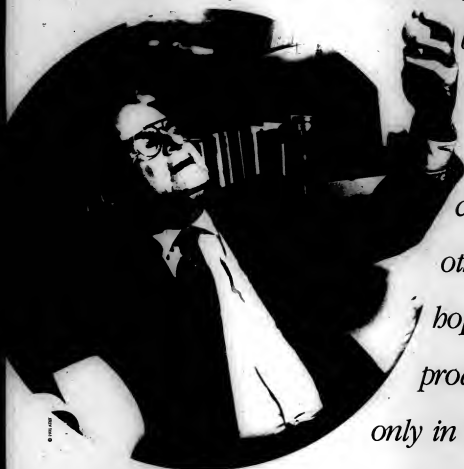


TP1 vs. TPC Benchmarks

The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similar to a batch test—focuses on database throughput.



*The world and all it encompasses divides neatly
can control and the things you can't. And as my
tee finds its way to the bottom of a water hazard as
little doubt in my mind which group golf balls fall
that I can easily control an entire phone system*



*but a dimpled
I mean, from
I get fault
configuration
other hand, all
hope that more
products for use
only in the hope that*

*into two groups: The things you
slice from the sixteenth
though it had a map, there is
into. And it is amazing to me*



*using AT&T's PBX Systems Management offerings,
ball the size of a dinosaur's brain has me mastered.
AT&T I get flexible systems administration,
management, performance management,
and accounting management. From golf, on the
I really get is frustration. I mention this not in the
people will buy AT&T PBX Systems Management
with their DEFINITY® System. I mention all this
AT&T will one day soon go into sporting goods.*



AT&T

The right choice.

EDITORIAL

Research Power

Earlier this month, one of the most venerable names in assessing customer satisfaction made a lot of hay by publicizing its first foray into personal computer end-user satisfaction.

J. D. Power and Associates surveyed some 2,200 end users and produced a Top 10 vendor list that some immediately anointed as the long-awaited Holy Grail of satisfaction surveys. After all, it was done by J. D. Power, not by some trade publication or research house (which have been doing such surveys for decades).

But as a consumer of PC hardware, you must understand what this widely and widely publicized survey is — and what it is not. Let's clear up some likely misconceptions.

The study is a consumer buyers' guide. Wrong. The study is not intended as a consumer buying guide, so don't use it as such. According to J. D. Power, it is for use as a "diagnostic tool" for the vendors. By the way, it is the vendors to whom the survey is being marketed for sale. One company spokesman said, "As far as I'm concerned, they're all good."

If my vendor is not among the top companies named, it fell below the industry average and was not published. Wrong again. J. D. Power surveyed users of only 16 hardware vendors. It refuses to publish those that didn't do well, but there are only six such companies. Don't assume your vendor is among them.

The survey compared apples to apples, looking at similar kinds of PC technology. Wrong again. The machines surveyed cut across a broad swath of technology from PC AT technology to Intel 486s. So it's entirely conceivable that half or more of the 100 IBM users surveyed were using vintage 1984 technology. That just might impact a user's impression of satisfaction, especially if his neighbor has a 486 on his desk.

Then there must have been a statistically valid number of responses to be able to rank vendors when there's such a variety of hardware available. The average number of responses was about 100, with some response levels in the 75 range. There are 50 million PCs in business use. Go figure.

Surely, the users surveyed have used more than one kind of machine in their work lives in order to make valid satisfaction assessments. According to the company, that question wasn't asked, so it's very possible some of those surveyed had no basis of comparison.

Like most publications, we see a lot of surveys and research cross our desks. Regarding this study, we completely concur with J. D. Power — this is not a buyers' guide. Nor can it be construed as anything approaching a statistically viable rating of PC vendors.

Oh yeah, you want to brag about winning this survey with some advertising? First, you must become a J. D. Power subscriber. Then let the company review your ad.

Ultimately, there's less to this survey than first meets the eye. There's also a lot more.



LETTERS TO THE EDITOR

IS myths

Regarding your viewpoint piece by Marc S. Sokol, "Mainframe programmers and the V-8 mentality" (CW, April 15), his comments concerning the "mentality" and other attributes of mainframe developers are particularly vexing.

He mentions our "language, style of dress and eccentric working hours." This insults not only the individuals but the organizations they work for. The professional programmers I know and work with are people who, not only in my organization but in others, bear no resemblance to the computer "geeks" of the '50s and '60s.

We wear suits or dresses, work from 8 a.m. to 4 p.m. and speak with our client community in business terms. We don't have to work the graveyard shift because our companies have recognized the value of development resources and have provided the necessary processing power.

As far as feeling that working on a PC would be demeaning is concerned, well... I simply cannot imagine a situation where a professional developer would turn down the opportunity to work with the most advanced tools at his disposal. That includes mainframe as well as workstation-based packages.

Finally, he pontificates that if IS managers don't jump on his bandwagon, these "less progressive, less realistic IS shops" will suffer "relatively low productivity." These conditions have absolutely nothing to do with the platform used for application development. They are directly related to the skills and professionalism of the analysts, designers, developers and implementers of the systems as well

as their management.

Eric S. Holland
Corporate Financial Systems
Woolworth Corp.
Milwaukee, Wis.

Business details

The suggestions provided by Howard Rubin in your "In Depth" column (CW, April 15) are helpful up to a point for measuring benefits from IS. There needs to be greater emphasis and more detail in the area of "business-oriented metrics."

Business managers are interested above all in return on investment: quantified business benefits compared with costs. It is the ability to properly quantify dollar benefits that produce a bottom-line measurement of IS value. Many IS investments are still being justified largely on cost savings and avoidance, while revenue- and profit-enhancing benefits are limited to guessimates or not quantified at all.

This procedure is particularly dangerous in the case of knowledge worker technology, where the greatest benefits are on the side of sales and profitability improvements.

In addition, the "business value delivered" approach implies that IS can produce business benefits without the integral input of users and the clear endorsement of management. While the contribution of IS must be measured, delivery of business benefits requires the integrated effort of all these players.

JoAnn Orloff
Manager
Value Assessment Program
Business Science
International, Inc.
Englewood Cliffs, N.J.

The right Pick

Perhaps *Computerworld* misses the point in "Pick market decision time" (CW, April 22). For both established Pick vendors coming up to Unix and Unix vendors newly embracing the Pick environment, we're actually experiencing a case of "if you can't be with the one you love, love the one you're with."

Your protectionism seems rooted in a contention that Pick infringes on some lebensraum needed by Unix. This discussion becomes intellectually interesting only when one considers the technical similarities and differences between the "Unix applications (which) appear to be the thing on which to concentrate..." and Pick applications. Are Unix applications really more pure (Unix) and their Pick counterparts less so? Your innuendo to that effect is unsupported.

There's nothing confusing about Pick — whether it is the state or married to Unix. Only after an enterprise is up and running in these time to address your concern about "scattering the focus of new users." And by then there's little motivation to bother.

M. Denis Hill
MIS Manager
Cornwatts, Inc.
Oakland, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



Not to burst anyone's bubble . . .

But sometimes those new technologies just aren't great ideas

MICHAEL B. COHN



My next-door neighbor is an entrepreneur.

He spends his time and money trying to get rich quick. I'd rather see him spend the time and money reseed his front lawn. Last time around, he sunk 10 grand into his latest scheme — nachos for dogs. He didn't fare too well. It turned out that the vast, untapped canine Mexican food market he envisioned consisted mostly of a few Chihuahuas.

With or without jalapenos, his idea was pretty lame. But we in IS are guilty of the same sort of thing. We push all kinds of new ideas and technologies. We're in such a hurry to make things better/smarter/faster that we can't see beyond the ends of our noses. The plain truth is, people don't want most of this stuff. If you're responsible for promoting any of the following ideas at your company, remember my neighbor and all of his leftover corn chips:

• **Image.** People are dropping

big bucks on image and optical storage, and I'm telling you, the idea won't fly. Who cares if you can store and retrieve documents, insurance claims and X-rays of your tennis elbow? It won't do any good. People are too busy to paper. They'll just ask for a printout, scribble all over it and then want to scan it back in and start the process all over again.

Face it, worse, some people will do their scribbling on those little yellow sticky things. So when the stickies get stuck in the scanner or on the floor near the scanner or at the bottom of somebody's purse, everyone will blame the computer.

Face it, we're not ready for image. It's complicated. It's expensive. People really want yellow stickies, and besides, you can get a whole mess of them for less than five bucks.

• **Voice response units.** My telephone works great, except when someone calls while I'm in the shower. Aside from that, I think we've taken the telephone as far as it should go.

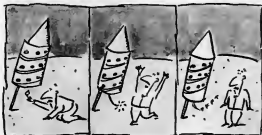
Yes, high technology can't leave well enough alone. Now everyone is trying automated

cooper against the wall.

It won't sell. People don't want Touch-Tone technology. They don't care about quick response. They're used to waiting weeks for the next available representative.

• **Multimedia.** I was pretty comfortable with the first word processors. When someone invented spreadsheets, I figured them out. And when graphics came along, I kept on top of things.

But now we're peddling audio



Don't Rush

telephone systems. Computer voices tell us to "press 1 now." They ask us to Touch-Tone in our Visa number. They demand we enter a name, last name first, until recognized or grossly misspelled or until we slam the re-

cards, image cards and full-motion video cards. And text and spreadsheets and pie charts and music and digital images and "Mr. Ed" reruns are all happening at once on my PC, and it's distracting as hell.

Just because something's "multi" doesn't mean it's good. I like my media one at a time. It's tough enough just watching a ball game while my wife is vacuuming.

• **Laptops.** This is another "smaller" idea that's out of control. Some say PCs emit radiation. Some say they're either way, I'm not too sure I want to put one on my lap. I keep too many important body parts near there.

• **Executive information systems.** This is the worst idea of all. Executives don't sit at workstations. They don't pull up charts and graphs. When executives want to know something, they pick up the phone or yell at someone or ask about it on the golf course.

What executives should do is create committee information systems; that's how things really get done. A committee decision-making system would give a whole bunch of folks a whole bunch of information and then let them get in an argument, call for a vote and recommend a three-month study. Better yet, maybe someone could come up with a committee procrastination system. Then we'd really have something.

Cohn is trying to be a computer salesman in Atlanta.

Is that a customer or the FCC in disguise?

BARRY LAMBERGMAN



The old marketing adage, "Know your customer," took on a new meaning at the Comdex computer trade show in Las Vegas last fall, when a number of computer vendors were surprised to learn that the prospective customer carefully looking over their products and asking a lot of questions was actually from the Federal Communications Commission. They were even more surprised when the FCC levied approximately \$200,000 in fines to vendors selling either personal computers or peripherals in violation of the FCC's marketing rules.

With the exhibit doors swinging open for another Comdex show, it is probably a good time to take a look at what the FCC's "shoppers" were using as selection criteria.

Generally speaking, violations of the FCC's marketing rules fall into two categories. The first involves violation of the rule prohibiting the sale, lease or offer for sale or lease (including by way of advertising) of any radio frequency device requiring

FCC approval, prior to obtaining such approval.

The second category involves marketing equipment that is not labeled in accordance with the FCC's rules, for example, failure to display FCC identification numbers. Thus, marketing equipment, even after it has been approved, can violate the FCC's rules.

Radio frequency devices

Although computer equipment is not typically thought of as "radio frequency devices," it is nonetheless subject to FCC approval as part of that category. This is because computer equipment either intentionally generates radio frequency energy for internal processes or sends radio frequency signals by conditionally associated equipment via connecting wiring. As a result, computer equipment that is not designed and manufactured in accordance with FCC-prescribed technical standards can cause interference with other radio frequency devices.

There are several classifications of computer equipment under the FCC's rules, and those classifications determine the type of FCC equipment authorization that is required. For ex-

ample, most Class B equipment (equipment marketed for use in a residential environment, such as personal computers) is subject to "certification," while Class A equipment (equipment marketed for use in a commercial, industrial or business environment) is subject to "verification," which is actually a self-authorization process.

In December 1990, the FCC issued a new release announcing that it plans to continue its efforts to improve marketing compliance at national computer industry trade shows. The FCC noted that it "is striving to improve the compliance rate so that all vendors can compete equally in the marketplace." Vendors who rush untested products to market, the FCC noted, gain an unfair economic advantage over their more law-abiding competitors.

There are several things that equipment vendors can do to avoid running afoul of the FCC's marketing rules.

The first is to ensure that marketing activities undertaken prior to certification or verification satisfy the conditions for "early" marketing set forth in the FCC's rules. For example, with respect to personal computers, the rules permit the advertising or display of such equipment at trade shows prior to FCC approval provided that certain approval disclaimer language is made a conspicuous part of the advertising or display.

Similarly, with respect to commercial computer equipment, the rules permit the actual demonstration of such equipment at trade shows prior to compliance testing, as long as a conspicuous notice is displayed indicating that the equipment has not been so tested.

In fact, even equipment that

COMPUTER VENDORS WERE surprised to learn that the customer carefully looking over their products was from the Federal Communications Commission.

is only in the conceptual, developmental, design or preproduction stage may be offered for sale, provided that the prospective buyer is advised in writing that the equipment must comply with the FCC's rules before final delivery.

In terms of establishing a timetable for bringing a product to market, a sufficient amount of time should be allowed for obtaining an FCC equipment authorization. Since it takes about 50 days for the FCC to process certification applications, every effort should be made to file a certification application at least two months prior to any trade

show at which it plans to take equipment orders.

It is also crucial to determine whether marketing plans are consistent with the classification of a given product. For example, a product may be designed to meet the less stringent Class A standards, based on the target market being commercial customers. However, if there is any intention of distributing the product through non-retail outlets or advertising it in a publication directed at the general public, a manufacturer should seek a ruling from the FCC that Class B certification is not required. All that's necessary to obtain a ruling is to show that the price or performance of the equipment is not suitable for residential use.

Awareness of the FCC's equipment authorization and marketing rules isn't only important to avoid obtaining a ruling. It can also be helpful in terms of avoiding unnecessary expenditures of time and money to meet technical standards more stringent than actually required.

Don't wait for the next trade show to find out what the FCC expects. One way or another, you may wind up paying dearly for the delay.

Lamberman is an attorney specializing in communications law at the Washington, D.C., law firm Fletcher, Smith & Nichols.

We all need to stop talking to ourselves

READER'S PLATFORM
CHRISTINA REBOLZ

As Buddha said, you never know where you shall find the bodhisattva — the teacher bringing you enlightenment. I recently received some enlightenment while attending an industry conference. Two-thirds of the attendees were from other vendors and delivered approximately three-quarters of the presentations. The remaining one-third were IS staff members, and they delivered the rest of the talks.

The enlightening part of the seminar didn't occur during any of the vendor presentations. Most of the vendors were discussing open systems, connectivity and object-oriented programming techniques using the buzzwords that you read in the major trade magazines and that I, as a vendor marketing manager, help to promote.

Enlightenment occurred during the question-and-answer sessions after a number of the panel discussions. This was the point at which the vocal minority — the IS staff members — would repeatedly say, "What you've

said is all wonderful theoretically, but it doesn't solve my real-world problems. You people in the computer industry have no idea what I go through in order to be successful at my job."

After hearing this message repeatedly for three days, it began to sink in, and it led me to a more important question. What is the problem with computer vendors and their relationships with their customers?

I think the answer is simple. My career is a good example for the explanation.

I graduated from an Ivy League university with a degree in electrical engineering. Upon graduation, I worked at DEC as a developer in one of its software research and development groups. Since DEC, I've worked at two software companies as a product manager and am now at a hardware company, where I have worked as a senior software product manager. I am currently working as a software strategic marketing manager.

Notice something missing? That's right. I've never worked in IS. In fact, I'd say 90% of the people I've worked with haven't. There is a certain element of

is in working for a vendor. ("Oh dear, I can't date Harvey. He codes in Cobol. Real hackers write in C.") It is virtually unimaginable to hire someone out of IS into a department other than industry marketing or tech-

ACTIVE LISTENING IS something we vendor types need to do far more regularly.

nical support (if they're actually using the vendor's product).

In fact, the only person I can think of that I've worked with who had a lengthy career in IS before joining a vendor was one of my former managers, Tom.

He taught me a lot about how IS worked and how to speak the language during a sales call. Most importantly, Tom also helped me listen to the underlying meaning of many of the questions I was asked during sales calls, questions I didn't think made a lot of sense.

For example, a decision mak-

er from one of the branches of the armed forces once looked me in the eye and asked, "If there is a nuclear war, how will you provide us with technical support?" Tom taught me that the correct answer was not to choke and say, "If we have a nuclear war, this company is covering its collective derriere and heading toward the hills," but rather to look right back at him and say, "I see from our agenda that a representative from technical support will be giving you a presentation in approximately an hour. He is better qualified to answer that question."

Admittedly, this is an unusual and extreme case. But by listening to these sorts of questions, I learned that virtually every customer has exceptional needs or concerns of some sort and that product and support definitions should include the ability to handle a wide variety of potential "red flags." In the case of the armed forces, I learned how much IS departments depend on their vendors for support during times of crisis, most of which can't possibly be predicted.

The list of other types of issues I had to learn about is long,

but, in summary, Tom taught me that I can learn a lot about how IS works by listening to questions. Active listening is something we vendor types need to do far more regularly.

All right, I'll bet a number of you are thinking, "Finally! A vendor 'listens up.' Not so fast.

Think about your own job history. Who are you working for? If you're working for First National Bank of Fredonia, how much money did you change before you started designing the loan tracking system? If you work for Masvine Manufacturer, what percentage of your lifetime salary did you draw from working on the shop floor before you put the manufacturing resource planning system into the factory? Just as importantly, are you considering the person who's interested in a career change to IS within your own company as you try to find people to fill positions? Or will you hire only college graduates with degrees in IS or computer science?

It's something all industries need to think about. Perhaps what we all — IS managers and computer vendors — need is a regular dose of the real world.

Rebholz is a software strategic marketing manager at Intel Corp. in Santa Clara, Calif.

Before you jump into production . . .

Examine the performance of your test system. If you don't know what you're doing, you won't know what you're getting.

With Hyperstat, you can get the most accurate, reliable, and complete test results. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

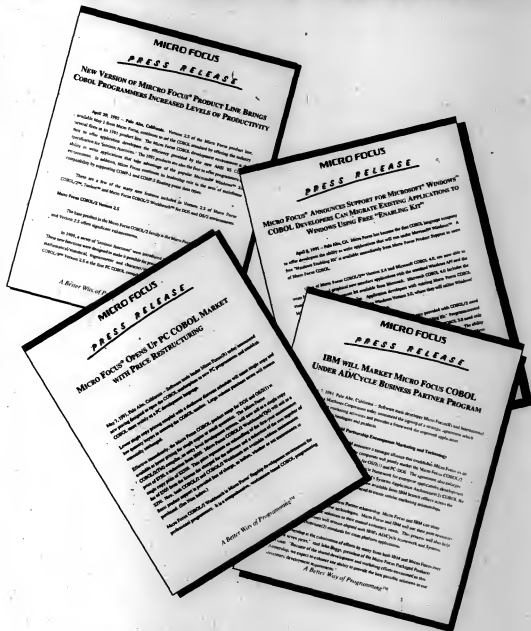
Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

Hyperstat is the only test system that can handle the most complex test environments. Hyperstat is the only test system that can handle the most complex test environments.

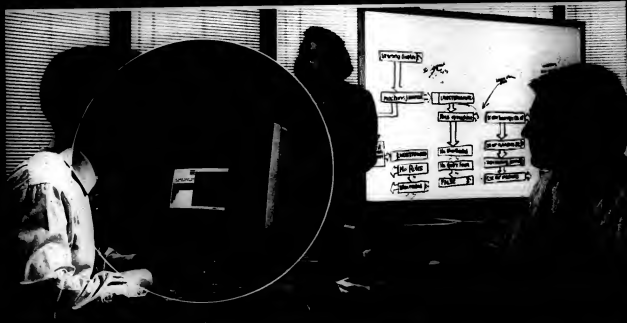
We Are Proud To Announce...



**If you want the rest of the story, please call us at 1-800-872-6265...
and watch for more news from Micro Focus, leader in programming productivity.**

MICRO FOCUS®
A Better Way of Programming™

If you need more productivity in application development...



It's time to re-Focus.

If application maintenance is strangling new development and the backlog is hurting your company's bottom line, it's time to re-FOCUS.

FOCUS, the world's leading 4GL, provides the most comprehensive toolkit for developing complete information systems for multi-vendor and multi-data environments. That's why more than 800,000 people worldwide use FOCUS.

COMPREHENSIVE TOOLKIT WITH FOCUS

FOCUS provides an integrated development environment that delivers all the tools you need to quickly create complete applications. The powerful FOCUS 4GL allows application prototyping, cuts coding time,

speeds maintenance, and enables you to test applications on one platform and deploy them on another. And, you can build "smart" applications that automate decision-making by integrating the LEVEL5 expert system—directly within FOCUS applications.

BUILD INTEGRATED INFORMATION SYSTEMS WITH FOCUS

FOCUS tools and applications are portable to over 30 hardware platforms plus 40 database and file types. Support for all major communications standards allows you to build client/server applications that can transparently access data across a wide range of multi-vendor systems.

Over 4,000 companies using FOCUS average one new application a-month. If your current application development environment is not matching this proven track record of productivity, call us toll free at 800-969-INFO.

Or write Information Builders, Inc., 1250 Broadway, New York, NY 10001.



FOCUS

Information Builders, Inc.

IT'S TIME TO RE-FOCUS

800-969-INFO

(Outside the U.S. 212-736-4433, X3700)

The advertisement refers to numerous products by their trade names. In most, if not all cases, these designations are claimed as trademarks or registered trademarks by their respective companies.

SYSTEMS & SOFTWARE

HARD BITS

IPL adds 8mm tapes

IPL Systems, Inc. recently unveiled its new generation of 8mm cartridge tape drives for IBM's Application Systems/400 midrange computers, including an upgrade path for IPL's current line. Claiming to be a "generation ahead" of IBM in 8mm technology, IPL officials said their new 6800, 6700 and 6600 series of 8mm subsystems provide twice the storage capacity and transfer speed of other 8mm products.

Star Technologies, Inc., announced that the Star 910/VP Compute Server, a Scalable Process Architecture supercomputing network server, can now operate in mixed network environments with workstations from both Sun Microsystems, Inc. and Digital Equipment Corp. The server is capable of delivering up to 160 million floating-point operations per second of distributed supercomputing power to a network of both Sun and DEC users in scientific and engineering environments.

The Sterling, Va.-based company has also signed an OEM agreement with IRI Research in Hanover, Md., that allows Star to distribute the firm's IRI research products for DEC computers and communications capabilities.

Users taste-test Unix flavors

IS groups turning to Unix question which version or versions to use

ANALYSIS

BY JOHANNA AMBROSIO
CWI/IBM

Commercial information systems shops are starting to say the "Unix" word aloud. Increasing numbers of them are at least looking into it, if not installing. Unix for applications such as software development.

However, users still grapple with the issue of which type of Unix to choose. Every manufacturer's version is slightly different, leading to support and integration problems. Although some users have standardized to an extent, many are running multiple Unix types.

While these IS shops are by no means touting their exist-

ing mission-critical systems, some consider Unix a cost-effective platform for new applications as they arise. Others look at Unix as the first step toward an open systems environment where there is mix-and-match hardware and software.

J. C. Penney Co.'s Dallas-based corporate IS shop fits into the latter category. "We're going open systems full blast," said David Evans, vice president and director of IS. The company, with Unix installed in areas including overseas operations, servers and a help desk, will be expanding the operating system into other areas over time.

"We expect to have a Unix option for every application," Evans said. Eventually, he added, he expects to see a library of

commercial Unix applications large enough to rival that of any other operating system.

Helene Curtis Industries, Inc. in Chicago is piloting a Unix-based computer-aided software engineering system. Tom Gude, vice president of business information services, said, "Open systems is the direction [in which] we're headed. There's a growing sentiment of not putting all your eggs in one basket."

Another company that is headed down the open systems road via Unix is Grand Metropolitan PLC in Minneapolis, the parent of Pillsbury Co. and other consumer brands. "We're convinced that Unix will be a key platform for us," said Carl Wilson, vice president of MIS.

Grand Metropolitan has Unix pilots in manufacturing and some corporate areas. Wilson said, although he declined to be more specific. "What we're going to

Continued on page 29

Different folks

The state of Unix implementations varies as much as Unix versions do. Users include the following:

- Grand Metropolitan PLC: A consumer products company piloting Unix in manufacturing and corporate IS areas.

- J. C. Penney Co.: Expanding Unix across the board (servers and help desk applications).

- Carlisle Technologies, Inc.: An aerospace defense company installing its first Unix application in engineering but considering using it companywide.

- Helene Curtis Industries, Inc.: Installing its first Unix application in computer-aided software engineering.

Reverse-engineering tool has repository ties

BY ROSEMARY HAMILTON
CWI/IBM

PEARL RIVER, N.Y. — CGI Systems, Inc. added a reverse-engineering tool for Cobol applications to its lineup of repository-based computer-aided software engineering (CASE) tools last week.

Company officials claim Pacreverse is a step ahead of most current reverse-engineering tools because it has a multuser implementation that ties directly to a repository. In addition, it al-

lows users to work with entire suites of applications instead of one program at a time.

Reverse-engineering allows users to bring more current procedures and organization to older programs. In the case of CGI's product, users can include data about existing programs in the about existing programs in the database repository. This data can then be accessed for future maintenance or reused when developing new applications.

GTE Data Services, Inc. in Tampa, Fla., tested Pacreverse in late 1990. It began implemen-

tation in January 1991. To date, the company has reverse-engineered 103 programs, and it gave Pacreverse high marks.

"We have worked through our last batch programs, and we are just starting with the on-line processes," said Scott Coyne, a systems supervisor. "So I think we are well under way."

GTE signed onto the entire CGI tool set in 1990, Coyne said. The firm reviewed 19 CASE offerings before selecting CGI's. Among other reasons, it has a central repository, and the company had plans to deliver a reverse-engineering tool.

"A majority of the tools on the market today only deal with new development," Coyne said. "Pacreverse does that well, but we

wanted a tool to help us gain some maintenance benefits [on existing programs]. Those costs are so high, and it made sense to attack that as well."

Pacreverse is ahead of the competition, but it is not a full-blown reverse-engineering tool, said Ed Achy, director of software research at Technology Investment Strategies Corp. "Their support for data is very rich, but they need to emphasize the procedural logic," Achy said. "That should be happening within the next 12 months or so."

Coyne said Cobol applications have two views: a data view and a procedural view. The first phase of Pacreverse focuses on data, but he said he expects CGI to deliver a second phase to address the procedural side as well.

NAPERSOFT

NAPERSOFT, Inc.
One Energy Center
Naperville, IL 60563-8408
708/420-1515

Treats Customers Write

NAPERSOFT® Automated Correspondence Software handles your written communications to customers quickly, accurately and professionally with:

- On-line or batch letter writing
- On-line notetaking
- Spell checker
- On-line letter history
- Full function word processor
- Full printer support

With your IBM mainframe and NAPERSOFT software you can streamline your customers correspondence! NAPERSOFT... for businesses that treat customers right.



FIRST
CLASS
SERVICE



The Death



**24 gigabytes of disk.
4 gigabytes of cache.
8 channels.
Redundant controllers
and power supplies.
Full battery backup.
All in one box.**

It's true. EMC's Symmetrix Series of Integrated Cached Disk Arrays does away with the large size of traditional DASD—while delivering sizable capacity and performance. The innovative use of proven technology makes it all possible.

We started with lots of small ideas. Like twenty-four 5 1/4" disk drives.

Symmetrix uses up to twenty-four, 1-gigabyte drive units. Each drive is one logical volume. And each unit contains its own micro-processor-based controllers and data buffer to maximize data transfer speed.

We then added up to 4 gigabytes of cache.

That's 16 times more cache than IBM's 3990-3 storage controller. With Symmetrix, all data is written to cache—eliminating rotational latency and head-seek delays.

Our proprietary cache search algorithm determines if a record is located in cache much faster than traditional methods. And because Symmetrix's cache is transparent to the host, you don't give up CPU cycles for cache management.

Built-in controllers emulate an IBM 3680 or 3990.

Our proprietary board-level

Free DB2 Software

That's right. We'll send you free software that will analyze your DASD space usage by DB2 and report how efficiently (or inefficiently) DB2 is using space allocated to it.

Why an offer like this?

As a recognized DB2 market leader, we want to make sure that everyone who manages DB2 is familiar with our products — especially the new ones we've introduced within the last six months. And word of mouth isn't always enough . . . So we're making this free software offer for you to see for yourself the tremendous benefits our products provide.

Comprehensive support for management and administration

- **Object Management** products simplify and automate many of the day-to-day functions revolving around managing the DB2 catalog.
- **Resource Management** products optimize the use of physical resources by DB2 and automate the process of reorganizing, backing up and recovering DB2 databases.
- **Plan Management** products isolate poor performing SQL and recommend alternatives before, during, and after application development.
- **Performance Management** products allow you to take a proactive stance in observing and managing the performance of DB2 applications.

Everyone benefits

Candle DB2 products provide tools to simplify and improve the work of those dealing with every aspect of DB2. DBAs, applications, and support services will all find tools that help them work with DB2 more effectively.

Absolutely no obligation

To receive your free software, send the attached coupon or call us at 1-800-843-3970, Dept. 404. We know you will want to see more of our DB2 products as a result. To see more in person, attend a DB2

"Illuminator Light Show" seminar in your area. It will introduce you to some innovative ways of managing your DB2 environment.

Seminar Schedule

May 21	Memphis	June 19	Calgary
June 6	Boston	July 16	Dallas
June 11	Nashville	July 17	Houston
June 13	Ottawa	July 18	San Antonio
June 14	New York	July 23	Tulsa
	Toronto	July 24	Denver
June 18	Winnipeg		

- ☐ Please send my FREE software.
- ☐ Tell me more about Candle seminars.
- ☐ Send product literature.
- ☐ Have an account manager call.

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

PLEASE RETURN TO:
Candle Corporation
DB2 Software Offer, Dept. 404
1999 Bundy Drive
Los Angeles, CA 90025

!Candle

Copyright © 1991 Candle Corporation.
DB2 is a trademark of International Business Machines Corporation.

SOFT NOTES

JYACC adds tool

JYACC, Inc. has announced that its JAM family of fourth-generation language tools is now available for AT&T's Starstream system. JAM front-end software tools provide a screen editor, an integrated data dictionary and a subroutines library, and they support the division of computing functions between the database server and front-end client/server applications for computing applications.

Interbase Software Corp., an Ashton-Tate Corp. subsidiary, and Convergent Solutions, Inc., recently entered a joint marketing and development agreement to produce an interface between the Interbase relational database management system and Convergent's Application Development System.

Aluminum maker sticks with mini

ON SITE

BY SALLY CUSACK
OF 10/97

NORCROSS, Ga. — Alumax, Inc., the nation's third-largest producer of primary aluminum and aluminum products, is still sold on the minicomputer as the most efficient and economical platform for its applications.

Alumax has Prime Computer, Inc.'s 50 Series midrange systems installed at five primary aluminum plants for database, business and maintenance functions.

Spread out among six locations, including headquarters, across the country, the Prime machines are responsible for numerous applications. These include purchasing, production reporting, order entry, billing, human resources and payroll programs.

According to Bruce Kerns, director of MIS at Alumax, all the software systems were developed in-house using Information, a Pick-like database management system offered by Prime.

There are currently six members of the software development team at headquarters here, and each location has between three and six software develop-

ers on-site to maintain systems and applications development.

"We chose Prime back in 1964 as the best supplier of Pick database products on a system," Kerns said.

Kerns lists messaging systems, pop-up windows, electronic mail and word processing as applications currently available to users via dumb terminals.

Alumax has 10 50 Series systems currently in operation. They support approximately 3,000 monochrome terminals and an assortment of Intel Corp. 80286- and 80386-based personal computers.

The company is in the process of constructing a raw-aluminum production plant in Quebec, where a Prime 6650 will be installed for business and production-reporting applications.

"Most of our plants have taken the approach that central database information must be shared, and as the databases are very large, it makes sense to do it on a mini," Kerns said. "It's

more economical."

He adds that he has not seen a client/server platform able to meet the company's needs with the same price/performance ratio.



Alumax uses Prime Computer machines at its five aluminum plants.

to us is currently delivered on the midrange systems.

There are several Prime 6350s and 6650s installed at headquarters, which is responsible for feeding all order entry,

billing and marketing requirements to the five plants over 19.2K bit/sec. AT&T leased lines.

Local communications at the plants are done via fiber optics, Kerns said. He explained that producing raw aluminum requires vast amounts of electricity, which in turn can interfere with more traditional types of communications lines.

The role of fiber

Fiber helps reduce the electrical interference with the systems, he said, adding that the company generally works with local contractors when installing a fiber network and that it has used technology from Fibronics International, Inc. and Synoptics Communications, Inc.

Kerns said that Alumax will probably be looking at Unix in about five years and may try implementing it in smaller locations or for specific applications prior to that.

He thinks that PI Plus, the Unix-compatible implementation of Prime Information, is a good direction for some time with Prime. We stayed with them through the hostile takeover attempt, and we feel they are good for the long run," Kerns said. "They have a good management team and good financial results."

Sterling announces initiative to focus on development

ANALYSIS

BY JEAN S. BOZMAN
OF 10/97

WOODLAND HILLS, Calif. — After a decade of growth through acquisition, Sterling Software, Inc. is now working toward focusing its resources on common product areas.

Most recently, one of Sterling's 14 divisions, Answer Systems Division, based here, announced a Corporate Applications Management Initiative (CAMI) that will pull together Sterling's applications development tools, mapping them against IBM's AD/Cycle architecture and filling in the gaps with new products by 1992.

CAMI joins earlier Sterling product initiatives, including the Corporate Storage Management Division, and the Corporate Data Communications Initiative, both introduced in 1990.

One of CAMI's main objectives is to array Sterling products against the AD/Cycle architecture. David Wear, president of the Answer Systems Division, said his group has the ability to bring a cohesive AD/Cycle mapping of its products to Sterling customers with strong products

at each point.

In announcing CAMI, Sterling is responding to industry pressures as well. "Sterling Software and its products have been seen as a disparate collection of relatively mature products, but they are not viewed by Wall Street or the data processing community as a leading-edge software company," said Robert Williams, an investment analyst at Dallas-based The Principal, Inc.

There are gaps in the offerings, Wear conceded, and gaps must be filled by more products or by packages sold by third-party providers. For example, the bulk of Sterling's products are in the IBM marketplace, and that must be addressed with a host of new open systems products, including Unix packages.

"They really have a lot on the table to pull off CAMI," said Ed Topor, president of Lake Bluff, Ill.-based Casewell International, Inc., a software consulting firm that uses Sterling's computer-aided software engineering

(CASE) products.

"I would expect it's going to take them one, and possibly two, years to do all the links between their CASE tools. You have to tie each of these individual product pieces to the IBM Repository, and that's going to be the driving force of the CAMI strategy," Topor added.

"They're going to link their other CASE tools to the [IBM]

which customers have the option of buying the entire Sterling product line or some of its components."

Because CAMI is not yet complete, users who attended the recent Sterling user group meeting in New Orleans expressed indifference to the CAMI marketing message. The purchasing pattern of many Sterling users has been to mix

Bank in Toronto. "Answer products have been used here for four years, but we're also using Easytrieve from Panoptic [Inc.] to download mainframe data to our desktop computers."

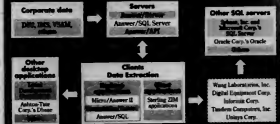
At Royal Bank, Blackwell and other programmers use Answer's Microanswer query product to import mainframe data into end-user spreadsheets such as Lotus Development Corp.'s 1-2-3.

User-critical

A few users were quite critical of Sterling's corporate marketing strategy in recent years, citing frustration with the current patchwork of products. "It's a poorly focused company," said one long-time user of Sterling's mainframe products, who asked not to be identified. "They're short-order cooks. They tell us, 'If we can't make it for you, we'll go out and buy it,'" he said. But other products, such as the Mark

IV code generator, are no longer supported to that user's satisfaction.

He said he plans to "downsize" several mainframe programs for development on PC local-area networks — and to stop using the Mark IV product, now renamed Mark V, altogether.



Repository through the Developer," Topor explained. Sterling's Developer and Integrator products, which Topor uses in his work, were acquired when Sterling purchased Montreal-based Asyst Technologies, Inc. last year. "They'll end up with an integrated CASE environment in

and match products from Sterling and other vendors, so consistency with other vendors' products is a key concern for those users.

"CAMI really wouldn't have an impact on our shop," said Arnie Blackwell, a technical systems analyst at Canada's Royal

SPEC adds benchmarks

BY J. A. SARGE
CITYVIEW

Two new benchmarks to rate the throughput of multiprocessing Unix systems were released last week by the Systems Performance Evaluation Cooperative (SPEC). Unlike its earlier benchmarks, from which users could get an idea of raw CPU speed for single-user workstations just by checking an average Specmark number, these benchmarks will take some involvement by prospective buyers.

"We've been fighting the tendency to

look for a single measurement. The two separate benchmarks are useful to point out different measures of throughput," a SPEC spokesman said. The organization's steering committee members went on to say that these benchmarks were not easy to use.

Numbers on the two benchmarks vary widely, although they both measure multitasking tests in jobs per hour. For instance, a Sun Microsystems, Inc. Sparcstation 2 rated 140.4 scripts per hour on one and 935.91 scripts per hour on the other. SPEC members suggested that those interested in using the benchmarks

NUMBERS ON THE two benchmarks vary widely, although they both measure multitasking tests in jobs per hour.

do their homework and decide which is more relevant to their work loads.

"It's like purchasing an automobile based on EPA mileage," said Steve Gaede, a steering committee member.

"You need to know what kind of driving you plan on doing—city or country." Additionally, a user's configuration is unlikely to match that of the benchmark configuration.

Not only are the new Specmarks more difficult to use than the earlier suite, but

they are based on software development applications, not commercial applications.

"If you assume that software development is in a commercial environment, then, yes, they are commercial. But in most minds, commercial denotes spreadsheet and word processing—and we're still looking at that," said Syriam Cheluri, SPEC's project manager for these benchmarks and the district manager for marketing/performance analysis at AT&T Data Systems in Lisle, Ill.

Changing software to fit your company
is one thing. Finding software that fits the way
your company changes is something else.



Good software should fit your company like a glove. But when your company changes and you grow out of your software, conventional wisdom says that you change the software as well.

At J.D. Edwards & Company,[®] we design software with principles rarely found in today's throwaway world: elevate software development from computer science to craftsmanship. Be obsessed with quality. Pursue innovative uses for CASE. Build upon our World Software Architecture.[®] Prepare the customer for anything.

The results are tangible. Our products are easy to modify and maintain. They adapt to change without custom programming. And new applications may be integrated painlessly.

Our software fits because it is made to change. But our values never will.

J.D. Edwards & Company,[®] business software for the IBM AS/400[®] For more information, call 800-727-5333.

J.D. Edwards

TRADITIONAL VALUES. NEW TECHNOLOGIES.

World Software Architecture is a trademark of J.D. Edwards & Company. AS/400 is a trademark of IBM Corporation. © J.D. Edwards & Company 1991. All rights reserved.

Security gear sales to take off

BY SALLY CUSACK
CITYVIEW

CLEVELAND — U.S. shipments of security access and deterrent equipment are projected to reach \$6.2 billion by 1995, according to a recent report by The Freedonia Group, a market research firm based here.

Technology-intensive products, such as computer-driven security systems, biometric systems and smart-card access controls, are projected to advance at double-digit annual rates, the report says.

Edward D. Hester, vice president of the durable goods division at The Freedonia Group, said computer-based security systems are giving customers an improved price/performance ratio.

"Computer technology is responsible for raising the effectiveness of the systems, especially in access control," Hester said.

The report divides access control systems into three main categories: card-based systems, keypad and combination devices and biometric systems, including voice and optical technology.

Shipments of access control systems, including readers, scanners, cards, computer peripherals, dedicated systems and software, are expected to grow dramatically and reach \$1.1 billion by 1995.

There are several specific advantages to computerized electronic access control systems, including easy reprogrammability to deny access (following a dismissal, for example), allowing a person access to some areas while denying access to others, limiting access to prescribed times of the day or night and keeping detailed records of all entries.

The report notes that card-based access control systems are popular among users but are vulnerable to unauthorized access by someone in possession of a stolen card. For this reason, more sophisticated systems have been developed, including those that require inputting a sequence of numbers on a keypad in addition to card access identification.

Microprocessor-based card systems have the potential to be integrated with biometric systems for maximum personal identification capability.

However, comprehensive biometric security systems are still relatively expensive when compared with keypad- and card-based access systems.

The Proprietary Mainframe
Will Never Die.



Until Something Better
Replaces It.

Introducing N The Open En



CR System 3600. terprise System.

Four Times The Power Of Conventional Mainframes At A Tenth The Cost.

NCR System 3600 is the world's most powerful, cost-effective enterprise system. It's designed to give management faster access to critical information. Helping your organization become more responsive and competitive. It's the first open system to surpass conventional mainframe performance. Yet it's only a fraction of the cost.

System 3600's unprecedented performance is made possible by an innovative parallel processing architecture that allows compute- and I/O-intensive tasks to be shared by dozens of powerful microprocessors.



This gives the System 3600 raw computing power mainframes can't match. Over 2000 MIPS today. Double that in the near future.

In certain applications, the System 3600 performs even better than those numbers suggest. For example, parallel processing is ideal for enterprise applications like relational database access, where System 3600 offers as much as a 1000% speed advantage over the serial architecture of conventional mainframes.

Under UNIX, NCR System 3600 runs hundreds of existing applications, and supports all popular communications protocols. It's part of a scalable family based on cost-effective microprocessor technology that extends from desktop PCs to a future enterprise system with performance over 100,000 MIPS.

System 3600 connects to your current computing environment, preserving your investment in proprietary systems while you move toward a more flexible, open environment.

For more information on NCR's Open Enterprise System, phone 1-800-CALL NCR.



Open, Cooperative Computing.
The Strategy For Managing Change.

NCR is the name and mark of NCR Corporation.
UNIX is a registered trademark of UNIX System Laboratories, Inc. ©1991 NCR Corporation

IBM says AIX at top of class

BY KEITH NEWMAN
SIC NEWS SERVICE

AUCKLAND, New Zealand — The days of IBM's AIX being seen as a proprietary version of Unix are over, and the battle is on to achieve standards between competing Unix versions, said Ahmed Chhibi, an IBM developer of AIX and the RISC System/6000 compiler technologies.

Chhibi said in New Zealand last week that IBM's Unix operating system for the RS/6000 is now better understood. The RS/6000 was released a year ago, and there are 3,000 major applications ported, plus 6,000 sitting on top of that. In the same period, 100 RS/6000 machines have been installed in New Zealand mainly the 320 and 520 models — and are used for commercial accounting and database functions.

"There is incredible competition in Unix. The better technology will always be adopted as standard, but you don't want standards to get in the way of advancement," Chhibi said. "Four criteria define what an open system is: portability, interoperability, standards and scalability. AIX conforms to these," Chhibi claimed. "Unix openness is really in X Open and Posix compliance; above that come things like de facto standards used by everyone, including Ethernet, SCSI support, X Windows or NFS from Sun. Users have made these popular, and as a result, you can't find a Unix system without them," he said.

"On top of that come OSF and Unix 5.4 extensions, which are similar in function. Then vendors add their own enhancements. This is where AIX stands above everyone else. We have implemented all the standards and added many features that make our Unix a more commercially robust system," Chhibi said.

Exciting evolution

Chhibi is enthusiastic about the way Unix and distributed computing are evolving. "The ability to have various computers from various vendors, possibly even running different operating systems, connected on a network and perceived as [a] single computer is exciting to me," he said.

All Unix is being enhanced, he said. The AIX plan is to incorporate advancements from the Open Software Foundation, including the distributed computing environment (DCE), data management environment, a shrink-wrapped version and greater security.

"We have filled in a lot of holes, including system management, disk management, tuning the system and adding devices which are normally lacking because users have traditionally needed a guru sitting next to them to do that," he said.

"Anyone supporting the DCE can interoperate with each machine doing what it is best at. I believe big computers in the future will be data warehouses simply holding data so individual pieces of that distributed environment can operate on that data," he said.

Chhibi said he anticipates a twentyfold improvement in the RS/6000 lineup this decade, with particular focus on enhancing graphics and CPU and I/O capability.

Benchmarks released for Oracle running on Sequent

BY JEAN S. BOZMAN
CPI STAFF

BEAVERTON, Ore. — Sequent Computer Systems, Inc. and Oracle Corp. jointly released audited results of their TPC-B benchmark test of the Oracle 6.0 relational database management system as it ran on a Sequent machine recently.

Rich Wells, manager of Sequent's Oracle marketing program, said the Sequent/Oracle 319 transactions per second result compared favorably with other TPC-B results for four-processor Digital Equipment Corp. Vaxcluster complexes running DEC's RDB and Oracle 6.0

RDBMSs.

The test of a simulated banking application running against a 35 million-row database resulted in a sustained rate of

THE TPC-B TEST was run over a period of several days.

319 transactions per second.

The TPC-B test was audited by Tom Sawyer, a consultant at Codd & Date, Inc. in San Jose, Calif.

It was run over a period of several days at Sequent's main campus here, using a Symmetry 2000/700 with 190M bytes of main memory and 35G bytes of disk. The Symmetry machine, which runs Sequent's version of the Unix operating system, is based on 16 Intel Corp. i486 processors.

During simulated eight-hour work loads, the database was stopped several times as power was shut off and disk drives were taken off-line. The database was then recovered using a "mirrored" copy of the database and an archived version, according to Sequent engineer Carmac Burke.

THE POWER THAT MOVES YOU...

ZENITH DATA SYSTEMS UPSETS THE BALANCE

MasterPort BRASS

The fully-featured notebook that sets the standard for the Intel 386 5L microprocessor. Its Premier System Management... with two separate resume modes... lets you hold work in active memory for weeks at a time.

Storage Tek adds automation to tape library control system

BY ELLIS BOOKER
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp. recently introduced an updated software control system for its tape cartridge library system that adds several features for automated operations.

The Expert Library Manager (EXLM) software works with Storage Tek's 4400 Automated Cartridge System. EXLM Release 1.1.1 reportedly streamlines pro-

duction processing as well as vaulting and cartridge-jection activities. The popular 4400 tape subsystem contains library "modules," each of which can hold up to 6,000 18-track, 1/4-in. cartridges. Up to 16 libraries can be connected together, for a total storage capacity of 96,000 cartridges.

Storage Tek, which recently sold its 2,500th library, said the EXLM software further automates routine functions such as disaster recovery data backup and off-

site processing.

The software can identify cartridges or groups of cartridges by volume serial number or data set name and can work in conjunction with a data center's tape

THE EXLM SOFTWARE further automates routine functions.

management system to remove specific volumes or volumes with specific data sets. EXLM ranges in cost from \$10,000 to \$13,750 and is available immediately.

Reverse

CONTINUED FROM PAGE 29

do is expand what we have now to fully integrate our manufacturing and commercial areas," he said. "We expect this vision to be in place over the next three to four years. Right now, we're experimenting with Unix and making sure we understand it."

The movement of commercial IS shops toward Unix was noted in the 1991 Software Market Survey, recently released by Sentry Market Research in Westboro, Mass. Of the more than 360 IBM mainframe sites questioned, 29% said they are likely or very likely to install Unix within the next two years. Among the sites with Digital Equipment Corp. computers, 44% said they will move toward Unix within the same time frame.

At Carleton Technologies, Inc., an aerospace defense company in Orchard Park, N.Y., the primary motivation for Unix is the availability of less expensive hardware. The company is planning to order DEC Decstations by the end of the month, according to Kenneth Krallman, MIS manager.

The engineering workstations will run Ultrix, DEC's Unix version, and will complement Carleton's existing Vaxstations, which run DEC's proprietary VMS operating system. "Decstations with Ultrix have better price/performance than Vaxstations — three to four times the system power and some up to 10 times, for the same money," Krallman said.

Open options

Although he is sticking with DEC initially because "they can integrate Unix into our entire environment," Krallman said he is keeping his options open for the future. "We will go wherever we can get the best price/performance. In the future, maybe some other vendor's Unix workstations will look good."

Also, he said, Unix will be an option for applications in the rest of the company within the next two or three years.

On the issue of which Unix to pick, Wilson said, "That's one of the things we're working out, but we're banking on the Poix standard." Most of the major manufacturers and Unix consortia have either pledged to support Poix or already do.

Evans said he has a mix of Unix System Laboratories' System V Release 4, DEC's Ultrix and versions from Sun Microsystems, Inc. and Hewlett-Packard Co. He said he is also piloting IBM's AIX. "It's a little more Unix than I want," Evans said. "I'm betting that Unix V.4 will ultimately be the winner, but I've been wrong before."

If there is safety in numbers, Evans' bet may turn out to be the winner. According to the Sentry Market Research study, 46% of the IBM mainframe sites and 31% of the DEC sites said they will implement System V. The runners-up were AIX for the IBM mainframe shops, mentioned by 44% of the IBM respondents, and Ultrix for the DEC shops, with 23%.

Whatever the organization's rationale for adopting Unix — cheaper hardware, open systems or both — one thing seems clear: Unix is no longer denied by only the "technies" who have always been partial to the operating system. Unix is starting to be brought in by the IS professionals who heretofore have shunned it as just one more thing to learn and support.

INTRODUCING 5 NEW PORTABLES FROM ZENITH DATA SYSTEMS.

The conventional way to look at portable power is from the PC's perspective. The processor. The speed. The memory. At Zenith Data Systems, we believe the proper perspective is yours. Zenith Data Systems, we believe the proper perspective is yours. PC. A philosophy exemplified by our five new portables. Our breakthrough MastersPort 366SL. The first notebook you can use, and use, and use, without ever thinking about battery life. Both so advanced, they just might replace your desktop. So if you want power without limits, these are the portables to move to. Unquestionably from Zenith Data Systems. For more information and the name of your nearest Zenith Data Systems Mediation Reseller, call 1-800-523-9393.



MastersPort 286 MastersPort 366SLX SuperPort 486SX SuperPort 486

OF POWER.

ZENITH
data systems

Groups Buil

Processors—Speed	286—12.5MHz	386—20.0MHz	486—25.0MHz	486SX—25.0MHz	486—25.0MHz
OS—DOS	MS-DOS 3.31	MS-DOS 3.31	MS-DOS 3.31	MS-DOS 3.31	MS-DOS 3.31
Hard Disk Drive	20MB	40MB	60MB	120MB	120MB
Video Display	SVGA 640x480	SVGA 640x480	SVGA 640x480	SVGA 640x480	SVGA 640x480
Video Card	Video 640x480	Video 640x480	Video 640x480	Video 640x480	Video 640x480
Power Management	• Sleep mode • Standby mode • Low battery operation	• Sleep mode • Standby mode • Low battery operation	• Sleep mode • Standby mode • Low battery operation	• Sleep mode • Standby mode • Low battery operation	• Sleep mode • Standby mode • Low battery operation
Software	MS-DOS 3.31 included	MS-DOS 3.31 included	MS-DOS 3.31 included	MS-DOS 3.31 included	MS-DOS 3.31 included
Weight (battery)	4.0 lbs.	4.0 lbs.	4.0 lbs.	4.0 lbs.	4.0 lbs.

Intel 80486 and 486 are trademarks of Intel Corporation. Windows, SuperPort, MastersPort, and Zenith Data Systems are trademarks of Zenith Data Systems Corporation. MS-DOS, Windows and Windows are trademarks of Microsoft Corporation.
Copyright © 1991 Zenith Data Systems Corporation

Manufacturing IS not yet in gear, study finds

BY ELLIS BOOKER
OF STAFF

CHICAGO — As if U.S. manufacturers needed another bit of bad news, a recent survey indicated that this sector of the economy continues to have very little success when it comes to applying advanced technologies.

What's more, the study, Deloitte & Touche's "Annual Survey of North American Manufacturing Technology," which was released last month by the firm's manufacturing, distribution and services group, indicated that manufacturers are collectively attributing fewer and fewer

benefits to some of the information systems technologies that many manufacturers labeled as vital to their future just a few years back.

For example, manufacturing resource planning (MRP), a class of centralized planning systems for manufacturing environments, has declined in importance, the study found.

"We believe the MRP investments of the '70s and '80s will be dismantled during the '90s," said James Schuetz, leading partner at Deloitte & Touche's manufacturing, distribution and services group, based here. Schuetz noted that during the past 25 years, MRP implementations

have suffered from high capital and training costs.

The number of survey respondents who expected MRP to contribute to future business declined almost 3% compared with the survey findings of one year ago.

Also out of the spotlight

Other items that respondents deemed slightly less important this year than one year ago included the integration of manufacturing systems, fourth-generation languages, the international Manufacturing Automation Protocol, relational databases and electronic mail.

Leading the list of information technologies on the upswing were Ethernet networks, local-area networks, electronic data interchange and the integration of systems across business functions.

Also, not surprisingly, many of the 872 manufacturing executives who responded to the survey said they lacked confidence in the technical capabilities of their work force.

Poorly educated workers were listed by 66% of respondents as being at least a moderately significant barrier to implementing technology. Half of the respondents also cited weakness in managerial leadership and vision as a significant deterrent. But an even larger number, 73%, said justifying the costs of high-technology investments was just too difficult.

Compuware DB2 roster enhanced

BY CAROL HILDEBRAND
OF STAFF

Compuware Corp. has supplemented its DB2 add-on roster by introducing Translate Workbench for DB2, a tool aimed at helping database administrators manage their IBM DB2 environment.

Translate Workbench automates and integrates the functions that database administrators need to analyze and maintain DB2, said Steven Scheidt, vice president of product management at the Farmington Hills, Mich.-based firm. "It allows the database administrator to select any number of objects from the catalog and perform all kinds of automation tasks," he said.

Using a windowed interface based on IBM's Common User Access, the user can use pop-up command lists, Help windows and cut-and-paste abilities for data manipulation testing and debugging, fault diagnosis and general management. All of the actions that relate to one object in the DB2 environment sit in one window.

Compuware got the seed technology for the product from Transamerica Corp., a San Francisco, Calif.-based financial services company. A group of IMS database administrators had assembled an in-house management tool, and Scheidt said his firm saw possibilities for administrators of other databases, including DB2.

"This is the first time we've gone directly to the database administrator," Scheidt said. "The trend [at user sites] is to consolidate tools vendors, which leaves the database administrator as the systems integrator."

Consumers Power Co., a utility based in Jackson, Mich., chose Translate Workbench when it needed help automating DB2 functions — "things like general control, reorganizations and migrating a database from test to production," said Alan Hise, a senior systems analyst at the firm.

Hise praised the tool's ability to help in migrating systems, a major task for DB2 administrators. For example, Hise said, after making changes in a database in test mode, an administrator can run a program that will compare the production version with the changed test version.

Translate Workbench for DB2 is priced from \$40,000 to \$85,000, depending on CPU size, and is slated for immediate availability.

A Classical Approach to Control Of Contemporary Dial-up Networks

The advantages of powerful, sophisticated network control systems, which enable managers of large local-area networks, have been denied to dial-up network users. GlobalView ends that disparity.

Now you can monitor, configure and control as many as 512 local database devices and any number of remote devices from a single location. You may control network security parameters, manage resource allocation, real-time, and historical reports are available via color monitors, with hard copy generated for later analysis.

GlobalView is comprised of Microsoft Windows-based software, an evolving variety of modules and other database devices and a compact 68710P1 equipment rack for use with your 80286-based PC controllers.

GlobalView is the classical solution to contemporary network management problems. For specifications, pricing and applications assistance, contact UDS at 800/451-2369 (in Alabama, 205/430-8000; FAX 205/430-8026).

UDS
UNIVERSITY DATA SYSTEMS

NEW DEALS

EDS nets \$40M contract with U.S. Army

Electronic Data Systems Corp. announced late last month that it had signed a \$40 million contract with the U.S. Army to supply an optical storage system for personnel records. Plans call for the system to be installed at locations in St. Louis, Indianapolis and Alexandria, Va. The contract will run for one year and includes five one-year options.

Cray Research, Inc. announced that Apple Computer, Inc. had ordered its second Cray supercomputer. The system, a Cray Y-MP2E valued at \$4.5 million, will reportedly be used for research and development applications. It is scheduled to be installed at Apple's main headquarters in Cupertino, Calif., this fall. Cray also announced the shipment of its 100th Cray Y-MP supercomputer. The new system, a Cray Y-MP2E, will be installed at Pfizer, Inc.'s Central Research center in Groton, Conn.

Convex Computer Corp. has reported that the German Climate Computer Center has ordered a C3840 supercomputer. The C3840, one of Convex's recently announced 3800 series systems, will be used for environmental research to learn more about the Earth's climate. Convex also announced that another C3840 had been requested by the Danish Meteorological Institute and that a C320 supercomputer had been installed at the University of Wisconsin at Milwaukee.

Late last month, Unisys Corp. announced the opening of a facility in Birmingham, Mich., that will provide information services for Ford Motor Co. and other customers. The Unisys Data Center was created as part of a three-year cooperative agreement between Unisys and Ford and will be used for remote processing support for several Ford divisions.

Digital Equipment Corp. recently announced that it has been awarded a contract by the Long Island Lighting Co. Under terms of the contract, estimated to be worth more than \$7 million, DEC will provide systems and services to connect more than 20 Long Island Lighting offices and power plants during the next two years.

Stratus Computer, Inc. announced that it will be selling a Stratus XA 2000 Continuous Processing System to Cathay Pacific Airways in Hong Kong. The airline will reportedly use the \$1.1 million fault-tolerant system to process cargo deliveries electronically.

The U.S. Navy recently placed two orders totaling \$3.8 million with Document, Inc., according to the company. Under terms of the agreements, Document said it will convert millions of pages of Navy documents, including technical manuals and the Military Specifications and Standards, to optical disc.

Software Architecture & Engineering, Inc. (Software A/E) has announced that Northwest Airlines has awarded it a contract for software development tools and services for the creation of an aircraft maintenance system. Under terms of the agreement, Northwest will use Software A/E's Strategic Networked Application Platform computer-aided software engineering tool, with Software A/E providing training and consulting services.

The 2.500th StorageTek 4400 Automated Cartridge system was delivered to the Bell Telephone Company of Pennsylvania, according to Storage Technology Corp. The system was one of four installed at Bell of Pennsylvania.

Prime adds 5370 to midrange line

NATICK, Mass. — Prime Computer, Inc. recently expanded its 50 Series line of midrange computers with the 5370 system.

Billed as the highest performing member of 5000 Series systems introduced last September, the new offering provides symmetrical dual-processing capabilities for high-end office environments.

Memory configurations range from 64M bytes to 128M bytes. According to the vendor, customers can use the 673M-byte, 5¼-in. disk drives to configure the 5370 to provide up to 32.3G bytes of

mass storage.

The CPU incorporates seven CMOS gate arrays. The central board also offers interfaces for two independent I/O buses, an extended memory bus interface, a cache, a control store and a maintenance processor. Designed to replace the company's older 6150 system, the 5370 is priced starting at \$226,000, and 5000 Series customers can upgrade from lower performance systems by swapping CPU boards, the company said.

The machines are currently shipping.

Vendors team on object plan

BY SALLY CUSACK
CW STAFF

DAYTON, Ohio — Technology makes strange bedfellows, as demonstrated last week when NCR Corp., Object Design, Inc., Hewlett-Packard Co. and Sun Microsystems, Inc. joined forces to propose an object management specification to the Object Management Group (OMG), an international organization of systems vendors and users.

Together, the companies are providing a comprehensive response to the OMG's request for Object Request Broker (ORB) technology. ORB defines an advanced method for using and sharing information on networked computers from different vendors.

This will allow third-party software vendors to use the method to lower the cost of writing portable applications with interoperability features in distributed computing environments.

The combined submission reportedly offers a consistent architecture that would provide support across different hardware, operating systems and networking platforms.

It will use an NCR Class Definition Language compiler, which will interface to NCR's Remote Method Invocation. Also included will be the Sun/HP Distributed Object Management Facilities, which offer a runtime applications programming interface for the development of portable applications across multiple distributed computing technologies.



RECONNECTING

Tactical Approaches to Multidiscipline Performance Monitoring in the SystemView Era

Tuesday, June 25
11:30 a.m. - 5 p.m. EDT

This interactive video conference will bring together MVS professionals throughout North America to discuss the future of the data center. **MSAR** six noted experts on MVS performance monitoring discuss critical multidiscipline issues... **DISCOVER** how other MVS data centers are solving real performance problems... **SEE** firsthand a new approach to performance monitoring analysis and reporting... **GET** your comments heard and questions answered.

The Panelists

Sue Barnes
Tom Basson
Ray Brow
Mark Friedman
Bob Johnson
Jim Whetston

Simultaneous telecast in the following cities:

Anaheim, CA
Atlanta, GA
Bloomington, MN
Boston, MA
Chicago, IL
Columbus, OH
Dallas, TX
Kansas City, MO
Los Angeles, CA
Mexico City, Mexico
Milwaukee, WI
Montreal, PQ
Nashville, TN
Newark, NJ
New York City, NY
Philadelphia, PA
Raleigh, NC
San Francisco, CA
Tampa, FL
Toronto, ON
Washington, DC

Participation is limited! To make absolutely certain you can attend in the city of your choice, call toll free TODAY!
1-800-227-8911

LANDMARK™

8000 Towers Crescent Drive
Vienna, Virginia 22182-2700
501011





Imagic!



NEW PRODUCTS — SOFTWARE

Systems software

Wind River Systems, Inc. has ported the Vxworks real-time operating system to Digital Equipment Corp.'s Decstation workstation platform.

Vxworks includes native networking support and an applications development environment. Currently, the system can be used to develop real-time applications for Lockheed Sanders, Inc.'s Star MVP VME board-based computers; support for other target systems is planned, the company said.

Vxworks now supports reduced instruction set computing (RISC) based on Sun Microsystems, Inc. Scalable Processor Architecture, as well as Mips Computer Systems, Inc. R3000 and Intel Corp. 1960 architectures. According to the company, Vxworks is the only real-time system available supporting all three major RISC architectures.

A server license costs \$19,500. Fees per target system are assessed for applications developed under Vxworks.

Wind River Systems
1010 Atlantic Ave.
Alameda, Calif. 94501
(415) 748-4100

Database management systems

The Empress relational database management system and fourth-generation language has been ported to run on Hewlett-Packard Co.'s Apollo Division workstations. Empress Software has announced.

Empress Version 4.3 runs with the standard X-11 X Window System interface, as well as Digital Equipment Corp.'s Decwindows, Apollo Domain and Open Look, under the AT&T Unix System V and the University of California at Berkeley's Unix environments. The product offers a variety of software tools with object-oriented capability and direct kernel access.

Pricing for the Empress system ranges from \$1,295 to \$250,000, depending on platform and number of users.

Empress Software
6401 Golden Triangle Drive
Greenbelt, Md. 20770
(301) 220-1919

Development tools

Kimberly-Clark Computer Services, Inc. has announced the release of Cross System Product/Application Development Enabler (CSP/ADE), an IBM AD/Cycle-compliant software product.

CSP/ADE provides executable templates for modeling applications as well as fourth-generation language development functions and tools. The product is intended to decrease applications generation time and reduce the CSP learning curve for developers, the company reported. CSP/ADE runs under the CSP development environment on MVS, VM and VSE platforms.

Licensing fees are approximately \$30,000 for VM or VSE versions and \$50,000 for an MVS version.

Kimberly-Clark Computer Services
Suite 1900
600 E. Las Colinas Blvd.
Dallas, Texas 75039
(214) 830-6800

Applications packages

Systems Union, Inc. has announced support for the Digital Equipment Corp. Ultrix operating system in Sunaccount financial software.

Sunaccount is one of two modules in the Sunsystems multicurrency accounting software package. It consolidates financial information in all currencies and generates analysis and reports. The product now supports both VMS and Ultrix environments.

Pricing for the Sunaccount module starts at \$3,600, depending on the processor size, the operating system and the

number of users.
Systems Union
10 Bank St.
White Plains, N.Y. 10606
(914) 948-7770

Britz Publishing, Inc. has announced the availability of the Bword 7.0 word processing software for the IBM Application System/400.

Enhanced features include a mailing list manager with a file format conversion utility, improved printing functions and a 65,000-word dictionary.

Bword costs \$199.
Britz Publishing
986 Madison Ave.
Madison, Miss. 39130
(601) 853-1394

Utilities

Synsort, Inc. has announced Synsort/Backup (Syback) 2.3, a backup software product for the VM operating system.

Release 2.3 incorporates support for IBM's VM/ESA and for shared file system data. A disaster recovery procedure has been added, and performance has also been enhanced.

Pricing is hardware independent. A three-year license, including new releases and all technical support, is priced at \$11,000.

Synsort
50 Tice Blvd.
Woodcliff Lake, N.J. 07675
(201) 930-9700

Apprehensive?



PLATINUM Technology, Inc.
555 WatersEdge Drive, Lombard, IL 60148
(708) 626-5000 FAX (708) 953-1923
1-800-642-6811 (U.S.) 1-800-648-0160 (Canada)
Corporate Sales Offices: Houston, Los Angeles, New York, Sacramento, Waterbury, CT
Domestic Affiliates: Chicago, Cleveland, Dallas, Delaware Valley, Michigan, Mid-Atlantic, Northwest, Wisconsin
International Affiliates: Argentina, Australia, Austria, Benelux, Brazil, Chile, Denmark, France, Germany, Israel, Italy, Malaysia, Norway, Peru, Poland, Scandinavia, Singapore, Spain, Sweden, Switzerland (Geneva and Zurich), United Kingdom, Uruguay, Yugoslavia
© 1991 PLATINUM Technology, Inc. All rights reserved. IBM is a registered trademark and OS/2 is a trademark of International Business Machines Corporation.

NEW PRODUCTS—HARDWARE

Processors

Sanyo Icon has introduced the 88open series of reduced instruction set computing (RISC) systems for Unix and Pick operating systems.

The systems are based on the Motorola, Inc. 88100 RISC chip set, with additional processors controlling I/O functions and disk operations. Up to 250 users can be supported. Licenses for both Unix and Pick are included with each system.

An entry-level system with 10M bytes of main memory, tape backup, a 383M-byte disk drive and interfacing for 16 terminals costs \$38,514.

Sanyo Icon
Suite 110
18401 Bon Karmen
Irvine, Calif. 92715
(714) 474-3993

Data storage

Universal Computer Systems, Inc. has introduced 8mm tape drives for IBM Application System/400 midrange computers.

The UCS-2300-XC, for AS/400 Models B30 to B70, features optional compression capability, allowing up to 7G bytes of storage per cartridge. It transfers data at a reported 600K byte/sec.

The UCS-2307, for AS/400 Models

B10 to B80 and C2 to C25, includes 5G-byte compressed storage and a 400K-byte/sec. transfer rate.

Pricing ranges from \$10,000 to \$33,000, depending on configuration and compression options. Connections for newly introduced AS/400 models will eventually be provided, according to the company.

Universal Computer Systems
6700 Hollister
Houston, Texas 77040
(713) 939-0088

Laser Magnetic Storage International Co. has announced the Independence Tape Subsystem for IBM Application System/400 computers.

According to the company, the subsys-

tem provides plug-and-play compatibility with IBM 2602 and 2607/2606 controller cards. The Independence offers 1.4G bytes of unattended backup capacity. Data transfer rates are 1M to 3M byte/sec.

The system costs \$29,900, including a 12-month warranty.

Laser Magnetic Storage
4425 Arrowwood Drive
Colorado Springs, Colo. 80907
(719) 593-7900

Storage Concepts, Inc. has begun shipping the Concept 550, a high-performance Redundant Array of Inexpensive Disks system for small computer systems interface peripheral users.

The Concept 550 provides up to 6G bytes of storage capacity and a data transfer rate of 10M byte/sec. Host adapters for several different bus architectures may be used with the product.

The company has also introduced the Concept 510, designed for real-time applications. The 510 model transfers data at 12M byte/sec.

Pricing for the Concept 550 begins at \$24,000. The 510 starts at \$22,000. Both models include controller disks, power supply and cooling system.

Storage Concepts
1622 Deere Ave.
Irvine, Calif. 92715
(714) 852-8511

I/O devices

Agile has introduced the S250 Optima, a protocol conversion/print sharing product for IBM midrange computers.

The Optima supports multiple ASCII printers through three twin-axial addresses. A parallel input port allows printer or sharing with other host devices, including Digital Equipment Corp. VAXs and personal computers.

Operating software is shipped on an upgradeable disk.

The S250 Optima costs \$1,895.

Agile
825 Alfred Nobel Drive
Hercules, Calif. 94547
(415) 724-1600

NCR Corp. has announced the NCR 6481, an 88 page/min. laser printer system.

The system supports standard printing software and can combine optical character recognition symbols, multiple font, logos and graphics on a single page. Resolution is 240 by 240 dot/in. The system can deliver an output of 1 1/4 million pages per month, according to the company.

The 6481 is priced at \$172,900.

NCR
1334 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-5278

\$22/hr. CICS, DB2, DL/I

CCD will develop your CICS, DB2, IMS DL/I, COBOL Applications @ \$22/hr.

• On a Fixed Price or T&M Basis
• FREE Fixed-Price estimate on your upcoming projects

Call Cary Schorr, Marketing Director
TOLL FREE 1-800-328-6755

CCD
SOLUTIONS
CCD Online System

Are you leading your MIS team toward a production environment based on IBM's DB2™ database management system? Do you get cold feet at the thought of entrusting your company's business-critical information systems to DB2 applications?

PLATINUM technology can boost your confidence in DB2—and your productivity. We've tested the waters of DB2, and we're poised to help you realize its benefits quickly, without apprehension.

PLATINUM's complete line of integrated software products, education, publications, and related services for DB2 can give you all the support you need to speed your success with DB2. Our clients report doubled and tripled productivity gains from their DBAs—and additional benefits for application developers and end users as well.

Don't hesitate. Call 1-800-442-6861 today for more information, product demonstrations, or free on-site trial evaluations of any PLATINUM products.

PLATINUM
technology



How to make the work go faster
and the money go slower.



NEC PowerMate 386/25S. The affordable entry to high performance 386 processing.

For advanced applications like CAD/CAM, presentation graphics or financial modeling, you can't go wrong with the PowerMate® 386™/25S.

For far less than comparable 386 systems, you get 25MHz speed, 2MB of RAM (easily expandable to 16MB via SIM modules) and a 32K memory cache. You also get something you can't get from anyone else at any price:

NEC. For more information call 1-800-NEC-INFO.

© 1989 NEC Corporation

C&C

Computers and Communications

NEC

PCs & WORKSTATIONS

COMMENTARY

Michael Fitzgerald

Is Elvis still alive?



If Elvis were a PC, he'd be an SX notebook. These things are sighted all over the place, but do they exist?

The Elvis Effect struck the SX notebook market the same way it hits the Chicago Cubs every summer. The spirit was willing, but the pieces were lacking, and the SX market became an apparition. The crush of vendors coming into the market simply overwhelmed the ability of component makers to meet demand; vendors announced machines last November or December, and some still dream of shipping products.

Compaq Computer's SX notebook has been showing up in the hands of users in increasing numbers after dribbling out of the factory in its early months. AST's is also shipping, although in scant quantities, and the same goes for Texas Instruments' new box. But all in all, vendors of SX notebooks have sounded rather like Samson, which trumpeted volume shipments of its SX notebook, then admitted volume was a low-digit 400.

Suppliers of key components such as hard drives and screens are now beginning to meet demand, and SX notebooks

Continued on page 56

OS/2 push faces uphill battle

IBM will have to work at its goal of wooing Windows-besotted users

BY PATRICIA KEEFE
CW STAFF

It may be that IBM has finally found the right track for OS/2. But if some recent reports are to be believed, the computer giant will move more than have its work cut out for it in its quest to garner a respectable chunk of the desktop operating system market.

Gartner Group, Inc., for example, predicted that Microsoft Corp.'s Windows 3.0 operating environment will capture 41% of the desktop market by 1995. As for OS/2, the Stamford, Conn.-based research firm's report said, that product's market share will be just half of Windows', which means that IBM will not succeed in its efforts to encourage most users to migrate

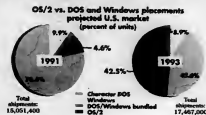
to OS/2 by 1995.

The rest of the market will be distributed among Macintosh

(20%), Unix (6%) and DOS (by itself, surprisingly, 10%), Gartner reported.

Time has come?

Shipments of OS/2 are expected to grow from being a sliver of the market to more than 42% in two years, one of several analysts said



Source: Workgroup Technologies, Inc.

CW Chart: Janet Gorman

IBM PS/2 high-end models garner mixed user reviews

BY RICHARD PASTORE
CW STAFF

Six months out of the chute, IBM's Personal System/2 Model 90 and 95 have emerged as qualified successes. Most users seem happy with the reliability and upgradability of the systems, but some question their features and the value of their costly architectures.

The Intel Corp. 1486DX-based Model 95 tower and, to a lesser extent, the Model 90

desktop are IBM's first reasonably successful servers, analysts said.

"The 95 was everything the PS/2 Model 80 was supposed to be and never was," said John Dunlap, an analyst at Workgroup Technologies, Inc. in Hampton, N.H. The Intel 80386DX-based Model 80 has been a laggard in performance and features, making it one of the least successful PS/2s, according to some analysts and users.

Storebrand/Computer Intelli-

gence in Dallas said IBM has sold a total of 3,500 Model 90s and 95s through March 31 via U.S. computer dealers — a respectable number, analysts said. However, persistent supply constraints are expected to hold back sales starting around June or July, an IBM spokeswoman said.

Users generally give the machines high marks for durability — a key point because a large percentage of the machines are being used as network servers. Many also point to the systems' upgradability complex as a prime benefit.

"I like [the idea of] being able to pull out the current processor and put in the 50-MHz processor

when that comes out," said Richard Bigelow, group manager at Pacific Telelink Group in San Francisco. "I don't have to scrap the box or board."

The removable processor board has made for a rapidly expandable line. Last month, IBM unveiled its 1486SX version of the Models 90 and 95 only one day after the chip was unveiled. The firm also revealed plans to incorporate Intel's upcoming 50-MHz 1486 chip sometime in early summer.

Despite trimming list prices 10% to 13% last month, the Model 90's and 95's pricing — ranging from \$10,845 to \$16,445 — is not as

Continued on page 53

Investing in Tomorrow's Bottom Line



Jerry Barnes, Chrysler Corporation

MICRO FOCUS
A Better Way of Programming™

Micro Focus Workbench Provides Chrysler Corporation with a Competitive Edge

In the fiercely competitive auto industry, programmers at Chrysler Corporation are using Micro Focus PC-based productivity tools to cut program development time and help move products from the drawing board to the showroom floor faster.

"The bottom line is that our business needs change quickly and we want to streamline the software development process as much as possible or Information Systems can be responsive to all of our operating units," said Jerry Barnes, Chrysler's Manager of Systems Engineering Technology.

Now using application development to a workstation environment allowed Chrysler to use its mainframe resources more efficiently and speed up development cycles by taking advantage of productivity tools not available in the mainframe programming environment. With this solution, programmer productivity improves greatly without a large investment in additional mainframe resources; an important consideration in uncertain economic times.

"The mind-set here a few years ago was, 'why would anyone want to do anything as up from the mainframe.' Now, we have over 200 named COBOL Workbench users."

With the Micro Focus COBOL Workbench, programmers can develop and maintain full-scale CCS/VMS and CCS/DLA applications independent of the mainframe in a fraction of the time.

"We quantified the time spent on typical software development activities. We showed how we could make a code change, compile the program, detect an error, correct the error and recompile the program again in less time than it would take someone to log in to the mainframe and submit the first compile. In many cases, the developer would make the change on the PC in two to three minutes, while it could take 20 to 30 minutes on the mainframe."

Jerry Barnes made his case for Micro Focus COBOL Workbench based on greatly improved productivity. The Micro Focus one-check, delay cycle, now an industry standard for PC-based programming made a big impact on throughput and costs.

Make the case for Micro Focus COBOL Workbench in your company. Call to get your "Makecase" kit today: 800-477-4365.

If you think the LaserPrinter E looks good in person,



wait till you see how it looks on paper.

Any way you look at it, the IBM LaserPrinter E gives you a lot of appealing features at a very appealing price.

The affordable IBM LaserPrinter E gives you all the advantages of laser quality output 25% faster than the major competitor, the HP LaserJet IIP. The IBM LaserPrinter E also comes standard with four times the paper capacity and twice the number of font slots.

Plus, the IBM LaserPrinter E is unique in its price range because it lets you customize your printer's speed and features to meet your exact needs at any given moment.

All of which makes the IBM LaserPrinter E the only affordable laser printer that lets you buy now and grow later.

	The New IBM LaserPrinter E	HP LaserJet IIP
Speed	✓ up to 5 ppm	up to 4 ppm
Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20

For example, if you decide you want faster printing, only the LaserPrinter E lets you double its speed.

Or if your software requires the Adobe PostScript® language, the LaserPrinter E can also give you that creative flexibility at a reasonable price.

Or if you decide you could use automatic collating of letterhead, second sheets and envelopes, the LaserPrinter E lets you add that, too.

Yet no matter how many features you add, the LaserPrinter E's unique stackable design takes up practically no more desk space.

So whether your first requirement is affordability, performance or flexibility, the IBM

LaserPrinter E should be at the top of your shopping list. See it today by calling 1-800-IBM-2468, ext. 982, for the name of your nearest IBM Authorized Remarketer.

The IBM LaserPrinter E. Suddenly, nothing else measures up.

Bright side, dark side of standards

ON SITE

BY RICHARD PASTORE
OF STAFF

BALTIMORE — Foresight in personal computer network standardization is paying off as the Federal Reserve Bank's fifth district begins augmenting and connecting its 20 local-area networks.

However, there is a downside to the standards effort. Premium hardware platform standards — IBM and Compaq Computer Corp. are the chosen vendors — have placed the budget-tight bank between a rock and a hard place. Many of the users are stuck with older generations of IBM and Compaq systems because the bank's tight budget limits its ability to upgrade to new boxes from those vendors. Cheaper clones are off-limits because they more often fail network compatibility tests.

The bank district, based in Richmond, Va., now operates districtwide applications exclusively on mainframes tied into various branches. But as plans get this year to migrate districtwide applications off the mainframes through 1992, the LANs will have to be connected in a wide-area network. That is

where standardization will have its biggest advantage.

"We established standards from the very beginning to allow us to evolve as we need without a lot of serious problems," said Roland Costa, end-user services manager in Richmond. "It would have been much more difficult to make the connections without standards."

The standards in question are IBM and Compaq servers and nodes, IBM's Token Ring network topology and IBM's personal computer LAN operating system.

Operating switch

The operating system, however, will have to be changed to Microsoft Corp.'s LAN Manager or Novell, Inc.'s Netware, depending on which is chosen as the standard. "PC LAN was a good starter, but it doesn't handle the centralized support capabilities and security we need," Costa said.

Security is the most important element of any network at the Federal Reserve, said Michael Ball, data processing director at the district's Baltimore branch. The office runs sensitive cash distribution services and check reconciliation applications on its LANs for

about 176 local banks.

Network standardization is already paying dividends on a more local level. The Baltimore branch recently implemented an optical disc system for much less money than might have been

considerable time and paper — where users once had to locate a report on fiche, print it on paper and fax it to a local bank customer, they can now access the report directly from optical disc and fax it to the customer bank right from a PC.

The decision to standardize on IBM and Compaq platforms

are not meeting people's needs," said Baltimore branch Vice President William Tignone. As many as half of the 200 PCs are Intel Corp. 80286-based boxes or below. Servers range from soon-to-be overtaken IBM Personal System/2 Model 70s and 80s to a single Compaq Systempro.

Part of the problem is the Federal Reserve System's conservative budget. "Incrementally, our budget doesn't grow by a large percent," Tignone said.

"It limits our automation growth, but we feel the growth we do manage is worth the investment," Ball added, noting that because of adherence to standards, the bank will not get stuck with a bunch of incompatible and useless PCs.

This may not suffice for long, as the Baltimore branch intends to add central purchasing and other applications to the network and expand the server load by more than 50 nodes. Budget money will have to be allocated for upgrades or the past investment in LAN technology may be in danger, Ball said.

The budget situation may get better before it gets worse: Despite the bank's efforts to optimize its Unisys Corp. 380 mainframe, the 3-year-old check-processing system is approaching capacity and will require a costly upgrade.



possible with a conglomeration of PCs and network topologies, Ball said.

The optical disc system consists of Panasonic Communications and Systems Co. 5¼-in. drives and jukebox, Intel Corp. Satisfaction boards and Macro Soft's Macrofile software. It runs on two separate LANs with its own dedicated servers.

The system, which replaces a microfilm document storage system, will pay for itself in three years, Ball said. It will also save

items from extensive software compatibility testing, Ball said. Second-tier clones proved to have network software and applications compatibility snags in far more cases than did systems from first-tier vendors.

Yet the relatively steep prices charged by IBM and Compaq leave some bank users stranded. Because of the high prices, the Baltimore branch has not been able to buy as many PC upgrades as it would have liked. "There are [IBM PC] XT's out there that

conform to the multimedia specifications announced by Microsoft last fall.

• Portland, Ore.-based Quattro Pro for Windows, which offers a feature similar to the Toolbars in Microsoft Corp.'s Excel 3.0 that allows tools and functions to be easily accessed. The product also includes tabs across the bottom of the screen that can be used to integrate related files.

• Cambridge, Mass.-based On Technology, Inc. addressed the confusion that sometimes results when several people simultaneously tinker with the same document. Instant Update, an application designed for the Macintosh platform, keeps tabs on the work everyone is doing

and notifies group members of changes.

Instant Update, which will ship in June for \$495 for two users and \$995 for groups of five, will not be available for Windows-based machines for a while.

• Palo Alto, Calif.-based start-up Userland Software, Inc. makes it easier for Macintosh users to customize their software with Userland Frontier, a combination scripting language and object database. The package will be available in October, but no price has been set so far, officials of the firm said.

• Users tired of tapping out addresses on envelopes with a typewriter may want to get their hands on Newark, Calif.-based

Tidemark Corp.'s Address Express, a specialized printer designed to produce addresses on envelopes at the touch of a button. The setup will sell for \$1,195 when it becomes available in the third quarter.

• Hydra Systems, Inc. in San Jose, Calif., demonstrated Hydra One, a PC add-in board that allows Macintosh software to run on a standard DOS machine.

• The Pagedb database publishing package eases the communications problems often associated with the integration of database management systems and desktop publishing setups.

The Windows-based application is from Pagedb Software Corp. in Seattle and is expected later this year.

GUI-related products grab attention at Demo '91 show

BY JAMES DALY
OF STAFF

PALM SPRINGS, Calif. — Representatives of nearly three dozen high-technology companies gathered in this desert oasis recently to provide a peek at trailblazing new products.

The mass unveilings — which ranged from multimedia personal computers to an unscheduled glimpse of Borland International, Inc.'s upcoming Quattro Pro for Windows — were the central focus at the birth of Demo '91, a

three-day confab organized by Stewart Allop, editor of the "PC Letter" industry newsletter.

The gathering was designed to rekindle the inventive enthusiasm that marked the early days of the PC industry, Allop said.

"There is always talk about mergers and strategic alliances, but new products are still the fuel that drives the industry," Allop said.

Highlights of the show included the following:

• Tandy Corp. became the first company to introduce PCs that

XDB. DB2 ON YOUR PC.

It Saves.

It Works.

It's Proven.

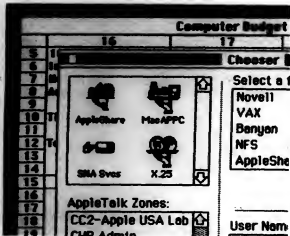
WEEK

COMPUTERWORLD

DB/IS



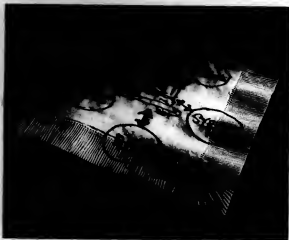
We're open



This is the Macintosh Chooser. A single point of access to a wide range of systems. The Chooser shows available network resources graphically and consistently. Just point the mouse and you're connected.



Macintosh offers an incredible range of tools for connecting with virtually any host-based environment, whether it's running SNA, TCP/IP, DECnet, or OSI.



Apple's Data Access Language (DAL) adapts popular off-the-shelf database, spreadsheet, and data analysis software to major SQL environments. So nontechnical users can easily access remote databases.



Apple A/UX™ lets Macintosh run UNIX™ applications plus thousands of Mac™ programs. At the same time you can run X-Window and MS-DOS applications, and cut, copy, and paste between any of them. No other desktop computer can do this.

© 1989 Apple Computer, Inc. All rights reserved. Macintosh and Chooser are registered trademarks of Apple Computer, Inc. in the U.S. and other countries. A/UX is a registered trademark of Apple Computer, Inc. in the U.S. and other countries. UNIX is a registered trademark of AT&T Corporation. DECnet is a trademark of Digital Equipment Corporation. and X-Window System is a trademark of the X Consortium.

to anything.



Macintosh shares data with DOS PCs via Novell, 3Com, Banyan, and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases, and multiple networks. Nevertheless, IS people are expected to make these all work together in perfect harmony.

But lately, a lot of people are finding the source of their solution a pleasant surprise: the Apple® Macintosh® computer.

They're finding that Macintosh comes out of the box with sophisticated networking capabilities designed right in.

That Macintosh is open to virtually any host, any file server, or any database, through any network.

That Macintosh makes the desktop the place where diverse systems come together.

And that with Macintosh you can build systems that let even nontechnical users access information from the desktop, no matter where that information resides.

And because Macintosh works with all your networks, databases, and hosts in one consistent and graphic way, it delivers major savings in implementation and training.

In short, Macintosh gives you the power to make information systems more valuable to the people who use them. The power to be your best.*



Macintosh gives people a single, simple view of the information and services that can help them do their jobs and serve your organization. See for yourself. Call 800-635-9550, ext. 552, and we'll send you a free video showing how Macintosh helps unify complex systems.



Eyes on Microsoft databases

Recent programmer hiring spree raises questions on future plans

BY JEAN S. BOZMAN
CW Staff

REDMOND, Wash. — Microsoft Corp. is hiring enough database programmers to create an in-house pool of experts for its SQL Server for OS/2 local-area networks, a product that is developed by Microsoft business partner Sybase, Inc. in Emeryville, Calif., industry sources said.

The recent hiring activity has not escaped the notice of database analysts and competitors, who said Microsoft's in-house database team would be capable of creating "client" database tools that would fit hand-in-glove with Sybase's database server for OS/2 LANs.

"There is some database project going on, but it's been very hush-hush," said David McGovern, president of database consulting firm Alternative Technologies in Santa Cruz, Calif. "Microsoft has gone out of its way to hire people for a new database group."

Microsoft executives acknowledged the buildup of data-

base experts but firmly stated that the motive was to create database tools within Microsoft's Applications Division.

"Microsoft is in the database server business," said Dwayne Walker, group business manager of Microsoft's Server Applications Group, a part of the firm's Network Business Unit. "You can say that the one thing the Microsoft Applications Division doesn't have is database tools," Walker said.

Devoted to SQL Server

However, Walker flatly denied any possibility that Microsoft's database experts might cook up an alternative to the Microsoft/Sybase SQL Server for OS/2. The SQL Server product, which has been shipping to users for nearly two years, has sold only between 5,000 and 10,000 copies worldwide, he indicated. That volume is far below initial expectations, said industry analysts, who cited the lack of SQL Server tools and applications (CW, April 29).

Walker did acknowledge some recent strains in the Mi-

crosoft/Sybase development relationship, stemming from the need to support both 16-bit and 32-bit versions of OS/2.

"We have been pressing them pretty hard to support both flavors of OS/2," Walker said. "We do press them about the things that PC users need, and sometimes they say, 'You need to prove it to us,' but there's give-and-take in any relationship."

Sybase executives agreed with Walker on both counts: The relationship with Microsoft is solid, and Microsoft's beefed-up database expertise is probably going to be used in the database tools and personal computer LAN applications area.

"They're probably hiring database people because of demand for the product," said Stewart Schuster, marketing vice president at Sybase. "I would guess over time they would provide add-on facilities as well. They could write a utility or a front-end tool. Think of SQL Server as a database operating system so that people can add products on top of it in the future."

Microsoft also needs in-house database expertise to provide technical support to customers who buy the SQL Server from the company, Schuster said.

Even if an internal Microsoft LAN database project should take hold, it would not yield viable products for 18 months to two years, industry analysts said.

"They don't have the resources or the time to develop another SQL Server equivalent in the near future," explained Rich Finkelstein, president of Performance Computing, Inc. in Chicago. "That would take many years of development and a different marketing and sales structure than they have right now."

Microsoft had an in-house database project called Omega for several years during the late 1980s, but it failed to produce a commercial product, industry analysts said.

Slow cycle

The development cycle for the OS/2 version of Sybase's SQL Server, which runs on Digital Equipment Corp. VAXs and on many 32-bit Unix systems, is deliberately slow, Sybase said. The newest Sybase relational database management system product, Release 5.0, is due out later

this year.

Microsoft is working to port Sybase Release 4.2 to the OS/2 SQL Server platform, Schuster said, while the current SQL Server for OS/2 runs Sybase Release 3.4 code. Schuster said the OS/2 product lag "thoroughly debugs products and new features before we lock them up in a box and send them out to the mass market."

THERE IS SOME database project going on, but it's been very hush-hush. Microsoft has gone out of its way to hire people for a new database group."

DAVID MCGOVERAN
ALTERNATIVE
TECHNOLOGIES

Inside that SQL Server "box," there is likely to be a new item, sources within Microsoft indicated late last month. A new, graphically oriented development tool, Visual Basic, is scheduled to be shipped inside SQL Server packages soon, possibly by June.

Conventional internetworking lets you connect widely-separated workgroups into a single, enterprise-wide network. But only at a very expensive price.

Which is why we believe Dial-Up Internetworking is an idea whose time has come.

Dial-Up Internetworking is the most cost-effective way to extend your enterprise network to the smaller, remote workgroups that comprise the bulk of the internetworking market. It uses the general switched telephone network, limiting the need for the high-performance T-1 lines and high-speed routers that drive up conventional internetworking costs.

Dial-Up Internetworking is made practical by another Telebit® first — a powerful automated dial-up router called NetBlazer. NetBlazer provides low-cost

Dial-Up
Internetworking.
The Most Cost-Effective
Connection For
Your Enterprise.



OS/2 push

FROM PAGE 47

Unix account for the remaining 5.4% and 2.7%, respectively. Gartner Group breaks down 1990 as follows: Windows had a 12% share, OS/2 had 1%, the Macintosh had 10%, Unix had 3%, and DOS had 69%.

Exactly how market share gets divided up in the future could depend in part on whether users are given a clear message about the feature sets and positioning of the 32-bit OS/2 2.0, OS/2 3.0 and 32-bit Windows.

OS/2 2.0 gives IBM a head start in the 32-bit operating system market, but a lot will depend on whether IBM is able to exploit its time advantage with a stable, reliable product. Hampton, N.H.-based Workgroup Technologies, Inc. thinks IBM can.

In a bulletin last month, the research firm urged its clients to "try OS/2 again — for the first time." Calling Release 2.0 "revolutionary," Workgroup Technologies predicted that "1991 will be remembered as the year that the industry bought into OS/2 as a robust, viable operating system" — particularly given that IBM opened up support for other hardware platforms, cut the prices and improved or

added support for DOS and Windows applications.

As a result, Workgroup Technologies has adjusted its estimates for both DOS/Windows and OS/2 shipments beginning in the fourth quarter of 1991. In severe contrast to TISC and Gartner Group, it predicted OS/2 will seize a 42.5% market share as early as 1993. DOS will retain a respectable 42.6%, but Windows is expected to wind up with a small 9% market share. Obviously, Workgroup Technologies expects interest in Windows to peak between now and 1993, by which point it will have been left in the dust by OS/2.

A number of variables will determine whether any of these firms' predictions come true, not the least of which is whether IBM delivers on its OS/2 2.0 promises. How Microsoft and IBM solve programming complaints is another variable. Microcros has a big head start here with the soon-to-be-released Visual Basic for Windows.

Also key is whether IBM will endorse OS/2 3.0 or come out with a portable OS/2 of its own. How users would react to a choice between two portable OS/2s at a time when Unix is expected to pick up even more steam is, of course, another factor that will affect the market.

IBM PS/2

FROM PAGE 47

universally appealing as their upgradability.

"There are a lot of cheaper clones that will do basically the same job," said Steven Mosby, data processing manager at St. Peter's Community Hospital in Helena, Mont. Mosby, who installed Model 90s as servers and nodes, said that in the future, he would consider a 486 clone as a node but prefers the safety of the

IBM name for servers.

The Models 90 and 95 also lack some of the desirable features that are built into rival servers. While IBM shops favor the IBM systems, users with no such allegiance are being swayed by the Compaq Computer Corp. Systempro with its disk array and nearly 20G bytes of maximum storage, according to dealers and users. The IBM systems top out at 12G bytes, and the firm does not yet offer a disk array.

The units' standard Extended

Graphics Adapter (XGA) has also come under fire and is considered overkill for server implementations, users said.

"XGA doesn't make any sense on the server. You want to shut the monitor off anyway," Mosby said.

XGA would be preferable as an option, allowing customers to escape the premium XGA charge presumably built into the PS/2's pricing, said Fred Zickert, manager of microcomputer support at Easton Corp. in Cleveland.

Tadpole jumps in with Sparc laptop

BY J. A. SAWYER
OF STAFF

CAMBRIDGE, England — In its first foray into systems, Tadpole Technology, Inc. will introduce an 18-million-instructions-per-second notebook computer called Sparcbook, which it claims is the first based on Sun Microsystems, Inc.'s architecture.

The \$6,000 reduced instruction set computing machine will bundle Ethernet, a send-only fax, a modem, a 16M-byte disk, 8M bytes of random-access memory, a floppy disk, the Unix operating system and DOS emu-

lation, according to Robert Gilles, chief executive officer at the company.

Packed in a magnesium case measuring 11.8 by 8½ in. and weighing seven pounds, the computer is slated to be available in July. It is initially scheduled to be available with AT&T's Unix System V Release 4.

However, it will not be a full Unix operating system but rather a subset of it, according to Laura Segervall, an analyst at San Jose, Calif.-based Dataquest, Inc. "It's a nice product and close to the right price, but [the Unix subset] will make it ap-

pealing to only a limited market."

"We're looking at the corporate market, not the individual buyer," Gilles said. "The average individual won't spend \$6,000 when he can spend \$3,000 for an X86-based computer."

Gilles suggested that the Tadpole machine will not replace desktop workstations, except in Japan, where desk space is at a premium. Instead, it is more likely to be used by a traveling executive to keep in touch with a company's executive information systems.

WAN capability on TCP/IP networks, supporting dial-up lines. It's the first product to combine the full suite of open systems standards in high-speed modems with those of TCP/IP internetworking.

NetBlazer uses the complete Telebit family of high-performance modems to connect remote locations in your organization together in a virtual wide area network, giving remote users transparent access to all network computing resources at a far lower cost than is possible with conventional internetworking technology. It complements the high-speed routers that move information over the corporate backbone.

Additionally, NetBlazer acts as a terminal server or modem pool. It can route Ethernet to Ethernet.

And can even use 56K leased lines.

WAN IP routing over dial-up is incredibly fast, thanks to NetBlazer's support for standard SLIP and PPP protocols combined with advanced techniques like TCP/IP header compression.

Dial-Up Internetworking is the kind of clear-sighted advance our customers have come to expect from Telebit. We've become the leader in high-speed, dial-up modems by delivering faster, more robust and reliable performance in mission-critical applications.

Call 1-800-TELEBIT for free information on NetBlazer. And find out why Dial-Up Internetworking is the most cost-effective connection your enterprise can make.



TELEBIT®

First in Dial-Up
Internetworking.



Which looks better to you?
More blue skies. Or fast delivery of real Open Systems.

If it's hardware and software you want, there's a computer company ready to supply them.
Hewlett-Packard.

In fact, we'll make it this specific. If you're planning to

add a system to handle a new strategic application, call us.

We'll deliver a computer solution that will tackle the immediate task. At the same time, it will integrate with products from other vendors, with other platforms, operating systems and applications.

Key to making this work is our

broad range of systems software technology. For the people in your company, this brings point-and-click simplicity, while allowing transparent integration of applications and access to data bases, both local and remote.

This Open Systems reality has a solid foundation. Six years

Ours.



HEWLETT
PACKARD

Delivery

of delivering standards-based systems. A dedication to networking standards, from LANs to WANs. And a family of RISC-based computers offering unmatched scalability from desktop models to multi-user systems.

For nearly twenty years, we've been delivering computers

to handle company-wide strategic functions. From materials management and financial analysis to office automation and distribution. And we offer service so superior that, in the Datapro User Surveys, HP has achieved the best overall record among industry leaders for cus-

tomers support satisfaction. For seven straight years!

For more information, call
1-800-637-7740, Ext. 1947.
You'll see there's nothing "blue sky" about our Open Systems.



HEWLETT
PACKARD

MICRO BYTES

Macintosh-using scientists, engineers unite

The first user association to focus solely on the use of the Apple Computer, Inc. Macintosh in science and engineering was recently formed in Worcester, Mass. Macintosh will draw its membership from a wide range of technical disciplines, including astronomy, chemistry, medicine and physics, according to Chairman Doug Newman. The group's first conference is scheduled for January 1992 in San Francisco, just before Macworld Expo.

In Hewlett-Packard Co.'s biggest sale of reduced instruction set computing buses, Mitsubishi Electric Corp. said it will buy 10,000-plus HP workstations, worth more than \$100 million. In the contract, which is for less than five years,

Mitsubishi will use and resell HP's newest 700 series and the expected follow-on minicomputer using the same chip.

NCR Corp. released its 7054 point-of-sale (POS) system, an Intel Corp. 80386SX-based POS system that runs Unix. The 7054 will support up to 11 workstations in a hub configuration and eight workstations in a star configuration. It can be configured for 1M to 16M bytes of random-access memory and two 16-bit IBM Personal Computer AT bus-compatible configurations. Hard disk options include 20M, 40M and 100M bytes. The system is targeted at the convenience store market. The 7054 is available immediately and will retail between \$5,000 and \$8,500.



No Matter Where the Sale Takes Place, You'll Know the Tax With Vertex

From Carl's Corner, Texas to Fifth Avenue, New York.

Vertex makes multi-state sales tax compliance fast and easy. We're the low overhead, low maintenance solution for mainframe, mini and PC systems. And, we're compatible with in-house and vendor-developed applications. Over 1,000 companies have already automated their sales tax compliance with our software and monthly database updates. To learn how we can help you, call us at 1-800-344-6518.

vertex

Where businesses turn for tax relief.

1041 Old Cassard Road Berwyn, PA 19312

Fitzgerald

CONTINUED FROM PAGE 47

are appearing. But now come comments like this one from Andrew Seybold, portable computer analyst at Dataquest, Inc. in San Jose, Calif.: "The SX notebook market is going to be the shortest market that ever lived."

What gives here? Is he saying, "Skip the SX, it isn't worth it?"

In a sense, he is. Seybold's comment comes in part from the existence of Intel's 80386SX chip, a version of the 386 chip specially designed for the portable market. It offers better power management, slightly better performance than its 20-MHz SX cousin and the ability to build smaller, lighter weight portable computers for about the same price as the 386SX. This translates to lower costs to vendors, or so the theory goes — vendors shift uncomfortably and mention something about development costs for a redesigned notebook affecting pricing in uncertain ways.

Seybold sees things differently: "A lot of [vendors] will try to position both the SL and SX in their market plans,

THE ELVIS EFFECT struck the SX notebook market the same way it hits the Chicago Cubs every summer: The spirit was willing, but the pieces were lacking.

but the price pressures on the SX are going to be fierce, and from the indications I have, SLs are going to be less expensive."

Seybold hastens to say he thinks SX notebooks will sell and sell well. But he thinks the spotlight now shines on the SL.

The SLs are going to be here soon. Zenith Data Systems led a flurry of SL vendors with machines on display at Comdex/Spring '91, and these machines are promised to ship before Comdex/Fall '91. Of course, that's what a lot of people said about the SX notebook, too, and significant quantities of those are just now shipping. Why should users wait for a new technology when they want portables today? The SL will be a significant advance, but more evolutionary than revolutionary.

Components suppliers will be more ready to meet demand this time around, and the lighter, longer-lived SL addresses the two major annoyances of portable users: weight and dead batteries.

To at least one user, SL might stand for "start leasing." Hyundai Motor America still uses 286-based laptops, but it does not own them. The company leases its laptops "because it gives us flexibility," says Carrie E. Unvestad, national manager of dealer communications at Hyundai. Unvestad says portable technology was changing so rapidly that leasing made sense.

With the expected rapid ramp-up of SL models, it may turn out that some of the SX versions announced late last year have, like Elvis, left the building.

Fitzgerald is a Computerworld Midwest bureau correspondent.

**INTRODUCING
DIGITAL'S
NEW PCs.**

**THEY NOT ONLY MEET
THE INDUSTRY'S**

STANDARDS.



**THEY RAISE THE
STANDARDS.**

IMAGINE THE WORLD'S FASTEST GRAPHICS PC COSTS ONLY \$6,000.

\$6,000 has never bought so much PC before. Because while graphics is this machine's heart, networking is its soul.

Introducing the DECpc™ 433 Workstation. It's a 486DX PC. It's a graphics PC with workstation performance. And it's an entirely new breed of business machine: the network PC.

The DECpc 433's revolutionary design allows your Ethernet network to take the place of a slew of expensive peripherals. So the engineers at Digital could add more of what you really need in a PC. Like graphics as rich as those of richly priced workstations.

The DECpc 433's built-in video controller gives you 1280 x 1024 resolution—far beyond super VGA. For crisper, more detailed

graphics. And cleaner, brighter windows. In fact, the DECpc 433 can run any VGA software at twice the size of standard VGA.

And when it comes to speed, well, the DECpc 433 Workstation is wired for it. You can

GRAPHICS AT ITS HEART, NETWORKING AT ITS SOUL.

rip through all your favorite DOS, OS/2, Microsoft Windows, and even X Windows applications. From desktop publishing to databases, imaging to computer-aided design.

But your work won't just go faster than ever; it will be easier

than ever. Because the DECpc 433's built-in Ethernet networking can put your company's entire network at your command. For massive file storage. Seamless printer sharing. E-mail. And more.

Put the built-in networking, the graphics and the 486DX power together, and you've got a PC so revolutionary, you won't find anything like it. Money-wise. Performance-wise. Or any other-wise.

Think of it this way. At \$6,000, the DECpc 433 is half the cost of a traditional PC with comparable performance. So why keep dreaming about everything you need in a PC? When Digital can put it all on your desk today.

digital

NETWORK PERSONAL

NOW QUIT DREAMING.



COMPUTING FROM DIGITAL.

NO ONE ELSE
CARRIES
PORTABLES
THIS FAR.



NAL

Presenting the DECpc 333 Portable and the DECpc 320sx Notebook. Two moving demonstrations of what a portable computer ought to be.

For starters, they are perhaps the first portables to be designed around today's software. Not yesterday's. Because both come complete with Microsoft Windows.

But that's far from all.

To make Windows easier to operate on the road, we created an entirely new mouse species. The integrated mousepad. Simply apply your finger to a touch-sensitive grid above the keyboard, and see how this mouse runs. (Sure beats trying to roll an ordinary mouse around on your airline tray table.)

Meanwhile, back at the office, your Digital portable snaps into an expansion chassis. So it becomes a network PC that ties you into the corporate power structure. You can even connect another monitor or keyboard, but why bother? Both our

portables feature backlit VGA screens for crisp graphics.

But if there's one question we haven't answered for you, it's

INTRODUCING THE DECpc PORTABLES FOR NETWORK COMPUTING.

which model to buy. Well, that's your call.

Think of the DECpc 333 Portable as the laptop of luxury. With a luxurious 4 MB of

memory and 60 MB hard drive, to complement the power of its 33 MHz 386 processor with cache memory. All in just 11 pounds. With a full three-hour battery life.

Then there's our DECpc 320sx Notebook. It proves that small is beautiful. With 386sx performance in an 8½" by 11" case that weighs in at comforting 6 pounds.

In fact, about the only thing our portables aren't light on is warranty protection. Both come with a full one-year warranty.

As you can see, our portables aren't just computers to be carried. They're computers you can carry to extremes.



digital

COM

THE WORLD'S MOST INTERPERSONAL APPROACH TO PERSONAL COMPUTING.

Digital's growing family of personal computers are all interpersonal computers. Because they're all designed for networking that will help your people work together easily.

So meet our latest interpersonal PC. The DECpc 433T.

It's the first in our new series of high-performance deskside PCs. And like every PC we make, the 433T gives you more

power for less. Because this highly expandable 486-based

**MORE PCs.
AND MORE
PEOPLE
TO STAND
BEHIND THEM.**

PC can do double-duty as a server — no matter what networking your company has.

But all bragging aside, the best PC network you can have is ours. Because our PATHWORKS™ family of networking products lets you tie your PCs into any major vendor's computers, or networks, in the world.

But there's far more to our PC story than just industry-

N E T W O R K P E R S O N A L



leading products.

Digital also gives you a very personal reason to buy your personal computers from us: Meet your Digital personal support team.

These unique people exist because there's another person out there who really needs them. And that's you.

You need someone who can help you tailor your PC solution

to your entire company.

Someone to stay around long after the sale. To keep all your PCs up and running all the time.

Someone to help you integrate all those PCs, minis and mainframes — no matter who made them.

Well, all that is exactly what your PC support team does for a living.

And no team ever had a more complete range of PC products

for solving your business problems. From innovative PCs at commodity prices. To PC networking. Even one of the widest selections of PC software around.

You see, while there are lots of PC vendors who claim to make it all, Digital may be the only one out there who can make it all **digital**™ work for you.

COMPUTING FROM DIGITAL.

DIGITAL'S PCs MEAN BUSINESS.



In a world where it's easier to find a PC vendor than a hot dog vendor, what could possibly make Digital's approach to PCs different?

The answer is that Digital's PCs mean business.

Digital recognizes that PCs these days aren't just toys on people's desks. They're serious computers. That run serious businesses.

That's why Digital has designed its PCs to meet some serious needs.

We design innovative industry-

leading PCs, and sell them at commodity prices — because businesses need to maximize their computing investment.

**CALL
1-800-
343-4040
EXT. 352**

We create PCs where networking isn't an afterthought — because in business, the network is where PCs do their real work.

We never cut corners that might compromise reliability, and we back up our quality with the kind of support that the world's largest corporations have come to expect. Because even the world's smallest businesses don't deserve anything less.

But no amount of talking about it could really convince you that our PCs mean business.

But talking to us can.

Our number is 1-800-343-4040. **digital**[™]
Ext. 352.

NETWORK PERSONAL COMPUTING FROM DIGITAL.

© DIGITAL EQUIPMENT CORPORATION. 1991. THE DIGITAL LOGO, DEJAN, AND ENTANVORES ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION. WINDOWS IS A TRADEMARK OF MICROSOFT CORPORATION. 486 AND 586 ARE TRADEMARKS OF INTEL CORP. OS/2 IS A TRADEMARK OF INTERNATIONAL BUSINESS MACHINES. A WINDOW SYSTEM IS A TRADEMARK OF MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

Everex PC: Strong on design, weak on speed

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Susanne Weisel.

Everex Systems, Inc.'s Tempo LX 386SX notebook may not be the most powerful briefcase-size personal computer, but reviewers said it is sturdy and dependable and has a keyboard some desktop systems might envy.

Performance: Running at 16 MHz with a 20M-byte hard drive, the Tempo LX has enough speed to get the job done if you are not in a big hurry. Random-access memory is expandable from 1M to 5M bytes, but the system lacks other expansion options.

Ease of use: The backlit LCD screen can be hard on your eyes, but it refreshes quickly and has good controls. The keyboard has well-spaced keys, and there are dedicated cursor, page-up and page-down keys.

Design: The system weighs a standard 6.9 pounds and is well-designed. **Power supply:** The nickel-cadmium battery lasts about three hours for basic data entry tasks but only about two hours for drive-intensive tasks.

Value: If you save your heavy-duty power applications for the office, the Tempo LX's basic features and outstanding keyboard are a good buy, reviewers said. It lists for \$2,895 with 1M byte of RAM.

Everex Systems, Inc.'s Tempo LX

Reviews	Performance	Ease of use	Design	Power supply	Value	Score
PC Week 4/1/91	Satisfactory	Good	Good	Good	Satisfactory	Good value
Users						
Time Sparks, Jetix				NC		Variable
Analysts						
GBL Lampson, The Lampson Report						Great value

Key: Very good Good Fair Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC, No comment. *In-house score based on 1 to 10 ratings

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Kirk Zinske, Research Priorities Review		
Source: Systems, Inc. in Fremont, Calif., had gross revenue of \$431.6 million and income of \$24.5 million in 1990. Ratings were obtained from financial analysts who follow the company		

Everex responds

Dennis Joo, product manager:

Performance: For those who require more speed and storage, the Tempo LX is now available in a 20-MHz model with a 40M-byte hard drive. It costs \$3,295. With a 60M-byte hard drive, it costs \$3,695.

Ease of use: We are working on improving the brightness and clarity of the screen.

AST Exec: Great price/performer but a bit big

AST Research, Inc.'s Premium Exec 38620/SX

Reviews	Performance	Ease of use	Design	Power supply	Value	Score
PC Week 4/1/91	Good	Satisfactory	Good	Good	Good	Analyst's choice
Users						
Billy W. Chiles, Watch Co.						Excellent
Analysts						
George Thompson, Design Research						Complete package

Key: Very good Good Fair Poor

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone surveys. NC, No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Robert O'Brien, Pyram Research, Inc.		

AST Research, Inc. in Irvine, Calif., had gross revenue of \$30.81 million and income of \$2.1 million in 1990. Ratings were obtained from financial analysts who follow the company

AST responds

Bret Berg, product manager for portable systems:

Ease of use: We chose the 8½-in. diagonal display because its dot pitch gives crisper resolution. **Design:** It is slightly thicker than other notebooks to accommodate a variety of features. The back edge is curved to fit comfortably into the palm of your hand.

AST Research, Inc. packed as much as it could into its Premium Exec 386SX/20 notebook personal computer, reviewers said, sacrificing a little in size but gaining a lot in performance.


Performance: It runs at 20 MHz and comes with a 20M-byte hard drive and 2M bytes of random-access memory, which can be expanded to 8M bytes.

Ease of use: Its IBM Video Graphics Array display can show 32 shades of gray. The keyboard is adequate, with an integrated numeric keypad and good placement of cursor control keys.

Design: You will need a large briefcase to carry the AST. It weighs a bit more than 7 pounds, and the smooth case measures 9 by 11.4 by 2½ inches.

Power supply: The nickel-cadmium battery provides three to four hours of life. Power management features abound, including a suspend feature.

Value: Reviewers said the AST Premium Exec rivals desktop systems in terms of features and performance and is priced on the low side for a notebook PC. It lists for \$2,995 with a 20M-byte hard drive, \$3,395 with a 40M-byte hard drive and \$3,795 with a 60M-byte hard drive.



Think about your own LAN for a moment. A complex mix of clients and servers. Hosts and terminals. Bridges and routers. Ethernet and Token Ring.

If you had a shutdown, how long would it take to find the problem? And how much would that downtime cost your company?

With the SynOptics distributed management approach,

you can isolate problems in just seconds.

The reason is simple. Visibility. The

SynOptics intelligent hub architecture gives you the ability to see exactly what's going on within your LAN—port by port, node by node, in real time.

Our unique auto topology feature will draw a map of your LAN automatically, right down to the port level. So you won't have to worry about your network operator



The SynOptics Approach to Managing Networks
Hubs gather, analyze and reduce LAN information
to create a larger network. Network Control
Engine offers more, greater control capabilities.

Yesterday's LAN Shutdowns Could've Cost
A Thousand Dollars A Minute
And It Could've Been Any Of A Thousand Causes.
All LAN Problems Should Be So Easy To Solve.

disconnecting the wrong device. And you can zoom in and inspect LAN activity as events happen.

All this information is presented through an innovative graphical user interface—crystal clear and actionable.

All this works because our network management system was designed from the ground up to provide a systematic way to manage change in your LAN. Add in our innovative technology, and there is simply no better way to build LANs.

And because your LANs don't stand alone, SynOptics implements industry-standard protocols such as SNMP, and integrates them into your host management environments—including IBM NetView™

To get a free informational video, call 1-800-544-1340. We suggest you do it soon. You don't have a minute to waste.

 **SynOptics**

The Hub Of Client/Server Computing™

Other brand and product names are trademarks or registered trademarks of their respective holders.

NEW PRODUCTS

Data storage

An image compression solution for personal computers has been announced by Video and Image Compression Corp.

The Picture Packer software package (\$79) offers on-line compression ratios as high as 5-to-1, or lossy compression up to 30-to-1 rates.

A hardware accelerator board is available for an additional \$599. The company claims the accelerator board cuts average image compression time to three seconds. Until April 1992, a \$100 rebate will be offered on the purchase of the accelerator.

Video and Image Compression

Suite 235
21311 Hawthorne Blvd.
Torrance, Calif. 90503
(213) 792-1659

Peripherals

Emerson Computer Power, an affiliate of Emerson Electric Co., has announced the Accupower Model 35, an uninterruptible power supply for mission-critical workstations and servers.

The 600 VA, 400W unit includes noise suppression, a light

and sound alarm system and 10-minute battery-powered operation. Optional Emerson kits will shut down unattended systems through the Accupower's computer interface connector.

The product costs \$599. **Emerson Computer Power**

Suite L
15041 Baker Pkwy.
Irvine, Calif. 92718
(714) 380-1005

Future Domain Corp. has up-

host adapters and software drivers.

The company offers kits for stand-alone personal computers running DOS and for multitasking PC-based networks. The company's Disk Maestro disk management software has added support for new peripherals; OS/2 and Novell Netware 386 drivers are included. Both 5¼- and 3½-in. disks are available, according to the company.

Stand-alone pricing starts at \$135. Kits for networked PCs start at \$216.

Future Domain
2801 McGaw Ave.
Irvine, Calif. 92714
(714) 253-0400

Extended Systems, Inc. has announced a fax-receiving add-on for the Hewlett-Packard Co. Laserjet IIIp.

The Faxconnection ESI-5010A directs incoming fax transmissions to the Laserjet for plain paper fax output. The product includes an auxiliary telephone jack, allowing fax transmission and receipt over the same line. A

256K-byte memory buffer is standard, with a 1M-byte option available.

The Faxconnection ESI-5010A is priced at \$595. **Extended Systems**
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Systems

Commodore Business Machines, Inc. has introduced two low-end Amiga systems.

The Amiga 500 Starter, targeted toward first-time computer users, is priced at \$599, including 512K bytes of random-access memory. A word processor, paint program and flight simulator are packaged with the system.

The Amiga 2000HD Professional is intended for small businesses and costs \$1,999. The system comes with 1M byte of memory, a 50M-byte hard drive and several business applications including spreadsheet, word processor and database programs.

Commodore Business Machines
1200 Wilson Drive
West Chester, Pa. 19380
(215) 431-9100

Samsung Information Systems America, Inc. has introduced a line of personal computers that include bundled software.

The Sensor SP 286, a 12-

MHz system, offers 1M byte of random-access memory, an IBM Video Graphics Array (VGA) monitor and Microsoft Corp.'s MS-DOS, Geoworks Ensemble, as well as several utilities programs installed on the 40M-byte hard disk.

The 16-MHz Sensor SP 386SX includes 2M bytes of memory and an enhanced VGA monitor. MS-DOS, Microsoft Windows 3.0 and advanced utilities are installed.

The SP 286 is priced at \$1,399. The SP 386SX costs \$1,995.

Samsung Information Systems
3855 N. First Street
San Jose, Calif. 95134
(408) 434-5400

Flytech Technology USA, Inc. has begun shipping the Carry-1 9000 series of book-size personal computers.

Intel Corp. 12-MHz and 16-MHz 80286-based systems and 16-MHz 80386SX systems are available. Nine- and 10-in. monitors are available as options on all models; the 16-MHz systems include a Super Video Graphics Array display interface. System random-access memory is expandable from 1M to 4M bytes.

The company reported that the Carry-1 9000 desktop sys-



Future Domain's SCSI peripheral controller upgrade kits are available on both 5¼- and 3½-in. disks

graded its small computer systems interface (SCSI) peripheral controller kits, which include

256K-byte memory buffer is standard, with a 1M-byte option available.

After the meeting, Steve told Jack,
"My LaserJet will call your LaserJet."



Your HP LaserJet is now a mailbox. Because with Hewlett-Packard's new LaserJet FAX, you can send facsimiles directly from your PC—or your original paper copy—and receive faxes on an HP LaserJet printer. Right at your desk.

With the HP LaserJet FAX, what you print on your LaserJet printer is what you fax.

So pages are received with their formatting, fonts, and photos looking just like the original. Even when sent from your PC.

If HP LaserJet FAX devices are installed at both ends, you can send and receive faxes that are identical to the originals. And because you print on plain paper, you won't have to contend with the curling thermal

paper that jams in your copier. You can also transmit to a traditional fax machine with improved quality.

The best part is that you can get all of this from your existing HP LaserJet printer. To receive a sample fax, and to find the location of your nearest authorized HP dealer, call 1-800-752-0900, Ext. 2298.

tems have the smallest footprint available.

Pricing ranges from less than \$400 for a 286-based system with monochrome monitor and floppy drive to \$3,000 for a 386SX-based system with 4M bytes of memory and an 80M-byte hard drive.

Database management systems

Cincom Systems, Inc. has ported its Supra mainframe relational database management system to several Unix platforms.

Supra runs on IBM's AIX Unix for IBM RISC Systems/6000 workstations. Licensing for the product is priced from \$2,750 to \$90,000.

Pricing for Supra on The Santa Cruz Operation's Unix platform ranges from \$1,500 to \$100,000.

Cincom Systems
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

Expressware Corp. has upgraded File Express, its flat-file database management system.

The source code for Version 5.0 has been rewritten in the C language, significantly improving performance, according to the company. Import/export capabilities are enhanced, and added features include file locking and multiple indexing.

The product costs \$99; registered File Express users can upgrade for \$39.

Expressware
125 Stella
Dayville, Wash. 96019
(206) 753-3453

Board-level devices

The OS/Ram32plus memory board from Capital Equipment Corp. reportedly adds 2M to 128M bytes of extended and expanded memory to any IBM Micro Channel Architecture-based microcomputer.

According to the firm, the product automatically configures itself for 16- or 32-bit operation and is compatible with all major operating systems. It uses standard in-line memory module chips.

The board costs \$349 with no memory installed.

Capital Equipment
76 Blanchard Road
Burlington, Mass. 01803
(617) 273-1818

Software utilities

Stairway Software, Inc. has announced Screenstender 2.0 for Wordperfect Corp.'s Wordperfect.

The utility program eliminates the need to scroll horizontally when viewing Wordperfect documents. It supports six screen display fonts and on-screen underlining, superscripting and character strikeouts, among other options. The program runs in 40K to 50K bytes of random-access memory.

Screenstender is priced at \$99.95. Upgrades are available for \$30.

Stairway Software
Suite 204
700 Harris St.
Charlottesville, Va. 22901
(804) 977-7770

Data Access Corp. began shipping FlexQL, a SQL-based report-writing software package.

The product reads and writes in file formats from relational database products and spreadsheets from vendors including Lotus Development Corp., Ashton-Tate Corp. and Borland International, Inc. It also imports and exports ASCII files and exports word processor files for mail merges. FlexQL provides

accurate page preview for all reports designed, the firm said.

A stand-alone version running under the DOS environment costs \$295; a network version costs \$695.

Data Access
14000 S.W. 119th Ave.
Miami, Fla. 33186
(305) 238-0012

Software applications packages

Inmars Research Corp. has announced Inmars Version 2.0, an upgrade of its document imaging software.

Inmars uses a filing-cabinet analogy for storage and retrieval of documents. The OS/2-based product, installed on a server, supports client systems running Microsoft Corp.'s Windows 3.0. An optional add-in with optical character recognition capability is available.

A stand-alone version costs \$2,495. The network version, for up to 19 workstations, costs \$1,995 per node.

Inmars Research
Suite 804
111 Peter St.
Toronto, Ontario M5V 2H1
(416) 581-1740

Titus Communications Corp. has

announced TitusDOS, a graphical user interface (GUD) designed for slower personal computers.

The product, which runs in 16K of memory overhead, is intended to offer GUI ease of use without requiring hardware upgrades. Menus use public-domain icons. TitusDOS utilities include a calculator, calendar and editor for files up to 61,000 characters in size.

TitusDOS costs \$49.95.

Titus Communications
1001 Ross Ave.
Dallas, Texas 75202
(214) 954-0630

Spreadware has begun shipping Spreadware Statistics Menu (Stats), a statistics package for Microsoft Corp.'s Excel spreadsheet.

Stats appears as an add-on to the Excel menu bar and allows users to generate analysis simply by selecting a target field and any statistical function. Versions are now available for Excel on personal computers and the Apple Computer, Inc. Macintosh, as well as for Informix Software, Inc.'s Wang spreadsheet.

The product costs \$89.

Spreadware
48964 Eisenhower Drive
Indio, Calif. 92201
(619) 347-2365

Introducing plain paper faxing for your HP LaserJet printers.



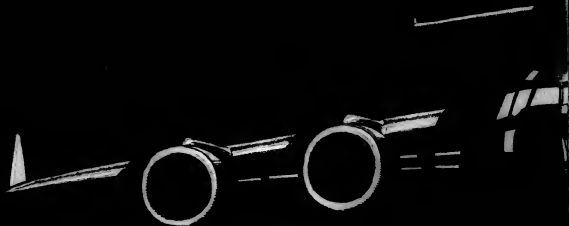
The new HP LaserJet FAX.

HP Peripherals
When it's important to you.

 HEWLETT
PACKARD

©1989 Hewlett-Packard Company PE12001





...every
design engineer
about floor, can
working in the way
And the



are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

are going to be
the ones who

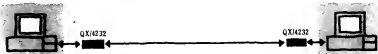
are going to be
the ones who

are going to be
the ones who

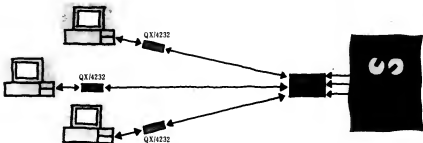
are going to be
the ones who

are going to be
the ones who

Our standalone modems stand out in their class.



Our modem management system is in a class by itself.



Whether you're looking for a high performance modem to provide one-to-one dial-up access to computing resources, or a multiple terminal to mainframe modem management system, Microcom has what you need.


Take our QX/4232hs.* It provides 38,400 bps throughput with up to 400% data compression and is fully compliant with all existing standards worldwide. That includes CCITT V.32, V.42 and V.42bis.

The QX/4232hs features MNP® 10, the most advanced version of the industry standard Microcom Networking Protocol.™ MNP 10 provides error free data transfer with Adverse Channel Enhancements™ (ACE™) to automatically adjust transfer rates up or down depending upon the line conditions.

Our HDMS™ is a chassis-based, data center solution that provides unprecedented dial-up

network management capabilities as well as proven dial access security.

And it's all from Microcom. The head of its class in price/performance.



Microcom Networking Protocol

Call **1-800-822-8224** today for complete information. We'll send you your choice of Microcom's FREE technology guides on "Microcom Networking Protocol" or "Managing a Dial Up Network". Or complete and mail this coupon to Microcom.

Please send me: ☐ "Microcom Networking Protocol" guide ☐ "Managing a Dial Up Network" guide

Name _____ Title _____


Company _____

Street _____

City _____ State _____ Zip _____

Telephone _____

C3/91



Microcom, Inc., Technology Guides
500 River Ridge Drive, Norwood, Massachusetts 02062-5028
(617) 551-1000, Fax (617) 551-1021, International Fax (617) 551-1007

MNP is a registered trademark and Microcom Networking Protocol, QX/4232hs, Adverse Channel Enhancements, ACE, and HDMS are trademarks of Microcom Systems, Inc. © Microcom, Inc., 1991. All rights reserved.

BIT BLAST

Cabletron unveils gateway

Cabletron Systems, Inc. recently introduced a gateway between its Spectrum network management system and AT&T's Accumeter Integrator system. Cabletron, which already had a gateway to IBM's Netview network management product, said the Accumeter gateway allows users to integrate Spectrum-controlled devices into environments controlled by AT&T's Unified Network Management Architecture. Accumeter is priced at \$11,995.

Cabletron also announced an agreement under which it will license Touch Communications Inc.'s Alliance Open Systems Interconnect network management software in a step toward supporting the Common Management Information Protocol. The Touch software will be integrated into Cabletron's Spectrum and Lanview/Windows platforms and into its line of Ethernet, Token Ring and Fiber Distributed Data Interface products.

Unable to adequately support Multinet, a Transmission Control Protocol (TCP) application for Digital Equipment Corp. VAX/VMS users, Novell, Inc. decided to end its OEM agreement with the software's developer TGV, Inc. Multinet connects VAX/VMS users to TCP networks and, until April 29, had been sold by Provo, Utah-based Novell. Santa Cruz, Calif.-based TGV said Escellan, Inc. had licensed the software in 1988, before it was acquired by Novell in 1989. A spokesman for TGV said supporting Multinet can be difficult because users have to know TCP, VAX and VMS systems very well.

Newspaper takes step into the LAN age

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — It was like running out of gas on the last lap of the Indianapolis 500: On election night at *The Washington Post*, the computer system used by editors and reporters to put together the morning edition went down for two hours.

Never again, said the *Post* after that 1988 debacle, and the untimely outage set in motion a sweeping overhaul of the newspaper's systems and networks.

The *Post* was lucky the failure did not last longer. The system had originally been supplied by Raytheon Co., but Raytheon had exited the business after

selling just one, and the *Post's* Tandem Computers, Inc. processor ran a modified and unsupported version of the Guardian operating system. At least there was no network to troubleshoot; reporters' and editors' dumb terminals were hard-wired into the Tandem processor.

"We asked, 'How can we get out of this situation?' We needed to keep the operating system pure, and we wanted to be on a mainstream system," said Elizabeth Loker, vice president for planning and advanced systems and the person guiding installation of the *Post's* new system.

Meanwhile, reporters, many of whom had personal computers at home, were demanding the same capabilities at work. "They saw big, 10-year-old terminals in

The Washington Post

To the post

The Washington Post is launching a network that includes the following:

- ◆ 700 IBM Personal System/2 Model 70 workstations and PS/2 Model 80 servers.
- ◆ OS/2 and LAN Manager.
- ◆ Connection to a Tandem Computers, Inc. Novaspire TSP host via IBM Token Ring networks, including a 16M bit/sec. backbone.

CW Chart: Dennis M. John

the newsroom, and all they could do was type a story," Loker said. With the move toward more open systems, it seemed time to also embrace network systems.

The solution: 700 IBM Personal System/2 workstations and servers running OS/2 and LAN Manager attached to a Tandem Novaspire TSP computer via IBM Token Ring networks. To avoid any more election night disasters, each hardware component — main processor, gateway, bridge, server and the network itself — will have a twin for backup.

Calif.-based System Integrators, Inc. won a contract in 1990 to make it all happen. System Integrators will replace proprietary terminals with Intel Corp. 80386-based PS/2s and will provide applications software for writing, editing, messaging and related functions distributed across the Tandem host, the network servers and the individual workstations. The company is also installing the network.

The Tandem host connects to dual, 16M bit/sec. Token Ring backbones via gateways that convert Tandem's Ethernet-based communications protocols to those needed for Token Ring.

The backbones will attach to 13 4M bit/sec. Token Ring sub-networks as well as to an Amdahl Corp. mainframe that holds the *Post's* library and archive system. The subnetworks are set up to support different editorial departments, and they allow network failures to be localized and isolated.

Loker calls the subnetworks "dumbbells," with one bit holding workstations in the *Post's* fifth-floor newsroom and the other bit holding servers and

Continued on page 74

LANs grow with groups

BY CHRISTOPHER LINDQUEST
CW STAFF

LA JOLLA, Calif. — Personal computer-based local-area networks are growing in size and number, with a large portion of that growth showing up in a narrow range of industries.

A study by Computer Intelligence, a market research firm based here, examined the penetration of large PC LANs within specific industry segments and found that while certain groups held significant percentages of the large PC LAN total, the actual percentage of organizations within those groups could be quite small.

This is partially explained by the tendency of some industries to be very work group-oriented,

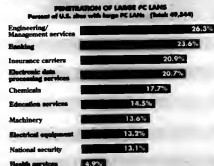
according to Dan Ness, an analyst at the firm.

For example, while large health services organizations owned 4.3% of the large PC LANs, only 4.9% of them actually had a large LAN. Conversely, large engineering/management services, a more group-oriented sector, contained 4.9% of the total number of large PC LANs, but penetration was much deeper, with 26.3% of the firms having large LANs.

The report looked at 82 industry groups divided into three categories by size: less than 100 employees, 100 to 499 employees and 500 or more employees. Nearly half of the PC LANs with 100 or more PCs fell into 10 industry classifications in the largest group.

In poor health

The health services sector shows the lowest penetration of large PC LANs with less than 5% at a time when several industries exceed 20%



Source: Computer Intelligence

CW Chart: Dennis M. John

European strategies unfold

Carriers move to prepare for 1992 open market

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

European carriers are putting a lot more effort of late into satisfying their international customers to position themselves as hubs for the open European market of 1992.

The market for trans-European network services is growing rapidly. Businesses are embracing their European presence and setting up systems and networks to support such applications as distributed inventory and sales reporting.

A number of companies are moving to minimize the need for an information systems presence at various European sites

by establishing telecommunications links between those sites and centralized applications at the home data center.

The financial company Credit Suisse, for example, already has an extremely centralized organization, with 1,200 electronic data processing people in its Zurich headquarters, and is thinking of further reducing its international technology centers, according to Oskar Gensch, a senior manager of IS at the firm.

"At least three companies I know — big ones — are concentrating their European IS into one data center," said Thomas Koehler, head of the service group of Andersen Consulting in Germany.

Long accustomed to enjoying

Continued on page 70

1977 Created the first mobile phone system. 1979 Built the first commercial private packet network. 1980 Created the first hybrid network using private and public capabilities.

MADE FOR EMERGENCIES.



1988 Sprint completes the only nationwide 100% digital fiber optic network. Awarded 40% of Federal Telecommunications System 2000 contract. 1989 World's first and largest

MADE FOR PREVENTING THEM.

Let's face it. There's no way you can stay competitive if your entire data network goes down. That's why you should take a close look at Sprint.

Because our entire network was made to maximize uptime. It has 100% digital switches. And 100% fiber optic transmission. Nationwide. Along with built-in redundancy to protect critical data. Maybe that explains why we had no interruptions during



Hurricane Hugo. Or the 1989 San Francisco earthquake.

So if your data means as much to you as we think it does, call us at 1-800-800-1517. We'll have detailed information in your fax machine in minutes. And we'll show you the right way to send data. On a network that was literally made for it.



Sprint.

Made for data.™

Software helps company make career change

Keegan uses Close-up software to sell Nutri/System centers and to start up accounting arm

ON SITE

BY JIM NASH
CT WRITER

SAN JOSE, Calif. — When the diet centers it owned were doing well, Keegan Management Co. used its polling software to track cash flow. When the market for fat diets went south with the economy, Keegan used the software to help sell the centers.

Next month, Keegan will use the same communications software, Norton-Lambert Corp.'s Close-up, as a key feature in its new accounting business, Matthews Accounting, Inc. Two years ago, the company owned 75 Nutri/System, Inc. weight-loss centers across the country and was valued at \$30 million, according

to Barry Matthews, vice president of finance at Keegan.

At that time, Keegan was at its apex, buying and managing independently owned and franchised centers. Chip Stimpson, information systems manager at Keegan, was hired to bring order to the chain's financial reporting.

"Most of the stores didn't have cash registers," Stimpson said. "They had cash boxes and deposited money in the bank by hand."

During Nutri/System's heyday, the stores were each bringing in an average of \$30,000 plus per week, Matthews said.

Learning the lingo

Keegan, on the other hand, is not high on a company of vigilant certified public accountants, Matthews explained. It was

frustrating for the company to wait as long as two weeks to get weekly cash flow reports from the centers.

"Our mandate was to get snapshots of the financials every day without making 75 phone calls. We looked at setting up a wide-area network but decided not to," Stimpson said.

Network systems, it was decided, were too expensive to operate for only nightly information uploads. Support appeared problematic, too, especially for centers in areas such as Iowa and Kansas, he added.

Keegan opted for an IBM Personal Computer-based system using Close-up for automatic dial-up and dumping of information on the company's IBM Personal System/2 Model 502. Stimpson said Quickway — point-of-sale software from FDC, Inc. in Nashville, Ky. — collects customer information and stores financial

data on PS/2 Model 30s. FDC also produces a data compiler and analyzer called Qcorp on the Model 502.

Much has happened, however, since the 1980s, when weight-loss businesses flourished, Matthews said. Congress investigated health risks associated with unsupervised commercial diets. Nutri/System was hit with a still-pending class-action suit charging that its program damaged dieters' gallbladders. Then came the recession.

Matthews said Keegan has sold all but 12 of the centers and is preparing to unload those as well. Close-up helps the company figure out a fair price for each center being sold by allowing Keegan managers to see exactly how each store did in sales the day before. "A store can go from a star center to a dog center in a week," Stimpson said. As the dieting business dies down, Matthews is working to prepare the debut of Matthews Accounting. The new accounting firm will target small to medium-size companies. Keegan is being transformed into a shell company.



DOS, OS, or CICS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-VIO — DOS/VS: Virtual Disk Drive. Moves the Standard Label Area directly into memory and allows for other heavily used non-permanent data to be moved into memory as well.

BIM-VSAM — Provides powerful design, monitoring and tuning capabilities for VSAM control and data sets. BIM-VSAM can be activated in either TSO/ISPF mode or batch.

BIM-EDDOW — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.

BIM-EDTDSO — The most powerful, flexible full screen editor available for DOS/VS.

BIM-EXT/VSAM — All of the features of our popular DOS editor and does not require the overhead of TSO. Can be accessed directly from VTAM or from CICS or other terminal subsystems.

BIM-POOL — Prints output in POWERVIEW, spooling output on local or remote 3270 terminal printers. (Purchased ICF Million Dollar Award 1980).

BIM-PLER — Optional laser printer support for BIM-POOL.

BIM-POON — On-line to Batch Print Spooling. Prints data passed from CICS application programs into the POWERVIEW spool.

BIM-PLIT — May be used separately or with BIM-POOL, to print parts of an existing job to terminal printers at separate sites.

BIM-POD — POWER Dynamic: Outlines performance enhancement. Eliminates 90% of the IO to heavily used POWER output.

BIM-PADE — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.

BIM-DOIS — Comprehensive problem analysis and display of operational CICS system. CONTRAK is an optional historical reporting feature to be used with BIM-DOIS to generate reports relating to system usage, DOS and OS.

BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.

BIM-PAGE — Automatically compresses selected VSAM files transparent to applications and users under DOS.

BIMTEXT — Word processing, document composition system. Creates formatted documents from free-form input, DOS and OS.

BIM-SPRIP — Switch local 3270 STAY terminals between multiple CICS partitions without special hardware or additional ports.

BIM-SCIPN — CICS 3270 data compression system. Reduces response time for remote terminals significantly, DOS and OS.

BIM-FRAMP — CICS IBM on-line time generation and maintenance, DOS and OS.

BIM-CHO — Copies one CRT's output to another or printer for problem determination and documentation, DOS and OS.

BIM-SETR — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system print, DOS and OS.

BIM-SETRY — On-line display of history directories and arrival, VSAM Catalog entries, data VTDC's, etc.

BIM-SCROL — Multiple/Terminal System Console function for CICS. Display-only or full keyboardable remote sessions.

BIM-SORTS — DOS/VS: System Status, Performance Measurement, and POWER Queue display.

BIM-INSUIT — On-line Job Edit and Submission facility.

BIM programs are cost-effective: some less than \$800, average \$2500. You can save even more with group purchase offerings. Products are available on permanent, annual or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4381-S system, online or remote.

© I & M MOYLE ASSOCIATES, INC. 612-833-2888
6781 Lincoln Drive Minneapolis, MN 55436

BIM

612-833-2888

6781 Lincoln Drive

Minneapolis, MN 55436

Affordable accounting

Telecommunications may help give birth to a new line of services for accounting firms. Keegan is preparing to open an accounting subsidiary that will automatically collect monthly financial reports from small and medium-size companies over asynchronous telephone lines.

Matthews Accounting, Inc., scheduled to open next month, will use Norton-Lambert Corp.'s Close-up software package to send operational accounting reports to Matthews' IBM PS/2 Model 502. The information is used for basic business processes such as accounts payable, payroll and general ledger.

A finance director ordinarily does this accounting, but in smaller firms, hiring a \$60,000-per-year employee to organize finances is prohibitive, said

Barry Matthews, vice president of financing at Keegan. Accounting firms would have to charge anywhere from \$40 to \$200 per hour to do the monthly work, which also makes owners of most businesses sweat.

Matthews, who will be president of the new accounting firm, said it is much more affordable for a company to contract out the work if the process of collection is inexpensive and standardized. He said the monthly uploads will be examined for completeness and stored for use later in a formal audit completed by Matthews or another firm.

Matthews said he will not vouch for the information's accuracy, and companies will be responsible for providing IBM PCs or compatibles to run Close-up and Solomon III accounting software from TLB, Inc. in Findlay, Ohio.

JIM NASH

USING SCRIPT?

Script is fine -- for programmers. But what about your end users? Try EdWord.®

- Easy to learn & use
- Full PROFS & OfficeVision integration
- Pull-down menus
- IBM AFP, Xerox PostScript, & HP LaserJet printer support
- English-like commands
- PC file compatibility
- WYSIWYG display
- Read & write DCA/RT files
- For CICS, TSO, CMS, ROSCOE

For more information, call Tom Cox at:

1 800 367-8729
(1 800 FOR-TRAX)

5840 Updell Way | Culver City, CA 90230-6620 | 213 649-5800

EdWord is a registered trademark of Trax Software, Inc. Other products are registered trademarks of their respective owners.

Trax
Software, Inc.

Today, to stay competitive, businesses like retailing have to provide more services. Without increasing their staff, the solution that does the trick is the Codex 6525. It's the Codex switch that allows you to handle more transactions and push your sales line.

**"THIS PACKET
SOLUTION
REALLY
SAVED ME
A BUNDLE."**



MOTOROLA
codex

Data Comm

USER'S
CHOICE

The Codex 6525 was voted "Best Equipment" by Data Communications magazine's recent X 25 award survey. For a copy call 1-800-426-1212 ext. 7215.

European

FROM PAGE 65

the privileges and trouble-free existence of a monopoly, the European Postal Telephone and Telegraph authorities (PTT) are waking up to the fact that they must compete with one another to get a slice of the expanding multinational networking pie.

U.S. firms tend to pick one or two countries as communications hubs for all of their European sites. Their choice often depends on which PTT gives them the most attractive combination of services and rates. This puts PTTs such as Germany's Deutsche Bundespost, which has been slow to lower international tariffs, at a disadvantage against carriers such as British Telecom

PLC and France Telecom, which have been more responsive to U.S. users' pricing demands.

Deutsche Bundespost is aware of the need to lower prices but is somewhat hampered by its responsibility to help fund the upgrade of eastern Germany's telecommunications infrastructure, according to company spokesman Lorenz Moosmüller.

Both U.S. and Europe-based

multinational companies have increasingly looked to value-added network companies with worldwide presence to put together their international networks. To many multinationals, it makes sense to have one first-class with various foreign carriers and find the source of problems when they occur.

PTTs have reacted by setting up value-added connections and

one-stop shopping agreements with major U.S.-based international carriers and value-added networks. The most aggressive moves of late have been made by Belgium's Regie des Télégraphes et Téléphones (RTT). Recent initiatives include the following:

- Legislation to make the RTT a "public autonomous enterprise" with greater control over its own budget and competitive strategies. The idea is to give the Belgian carrier the flexibility to compete more effectively with private companies in the European telecommunications market. France's administration initiated a law this year that does approximately the same thing for France Telecom.

- A bilateral agreement signed with AT&T last September to provide global Software Defined Network Services, CCITT X.400-based interconnection of electronic mail services and one-stop shopping.

- A similar agreement signed with U.S. Sprint last March.

- A second international gateway to provide customers with redundant backup links.

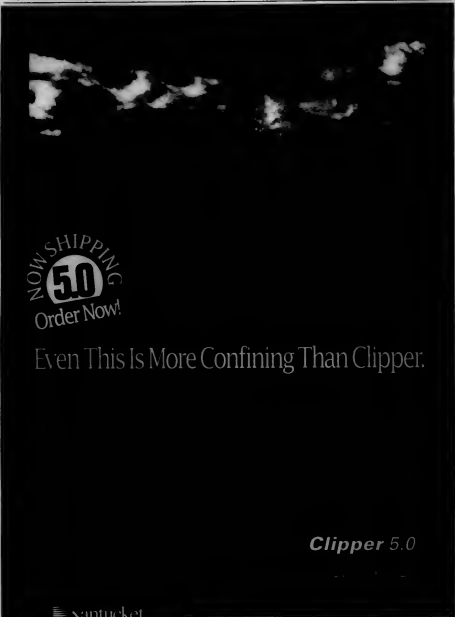
- Investment in an undersea fiber-optic cable joining the UK with the European continent via Belgium.

Aggressive competition

Several of the less advanced PTTs have launched marketing campaigns this year to show how aggressively they are moving to revamp their networks. Swiss Telecom, for example, announced earlier this year that it would spend more than \$10 billion during the next four years on projects such as the digitization of up to 90% of Switzerland's exchanges and complete installation of Integrated Services Digital Network (ISDN) by 1992.

At a gala opening in New York of its first U.S. office last month, Spain's Telefonos de España presented itself as the "natural link of the world" — it is the geographic center of four continents. The carrier plans to have 82% of its trunk lines and 56% of its local lines digital by the end of next year. It is also deploying ISDN and plans to have generally available enriched 56K and 64K bit/sec. offerings by July, according to Adolfo Suarez, vice president and general manager at Telefonica USA.

France Telecom, while still a monopoly, has become a leader in Europe when it comes to deploying advanced network services such as ISDN. At the turn of this year, the French Ministry of Postal, Telecommunications and Space enacted laws to further open France to communications from value-added network providers. It also cut France Telecom's economic and management ties to the ministry, leaving the carrier free to use all of its profits to enhance its own services and start new ventures.



Now SHIPPING
50
 Order Now!

Even This Is More Confining Than Clipper.

Clipper 5.0

santucket

Sanctuary Corporation, 1200 West Jefferson Boulevard, Los Angeles, CA 90024. (213) 358-7727 FAX: (213) 358-7728. (213) 358-7729. (213) 358-7730. (213) 358-7731. (213) 358-7732. (213) 358-7733. (213) 358-7734. (213) 358-7735. (213) 358-7736. (213) 358-7737. (213) 358-7738. (213) 358-7739. (213) 358-7740. (213) 358-7741. (213) 358-7742. (213) 358-7743. (213) 358-7744. (213) 358-7745. (213) 358-7746. (213) 358-7747. (213) 358-7748. (213) 358-7749. (213) 358-7750. (213) 358-7751. (213) 358-7752. (213) 358-7753. (213) 358-7754. (213) 358-7755. (213) 358-7756. (213) 358-7757. (213) 358-7758. (213) 358-7759. (213) 358-7760. (213) 358-7761. (213) 358-7762. (213) 358-7763. (213) 358-7764. (213) 358-7765. (213) 358-7766. (213) 358-7767. (213) 358-7768. (213) 358-7769. (213) 358-7770. (213) 358-7771. (213) 358-7772. (213) 358-7773. (213) 358-7774. (213) 358-7775. (213) 358-7776. (213) 358-7777. (213) 358-7778. (213) 358-7779. (213) 358-7780. (213) 358-7781. (213) 358-7782. (213) 358-7783. (213) 358-7784. (213) 358-7785. (213) 358-7786. (213) 358-7787. (213) 358-7788. (213) 358-7789. (213) 358-7790. (213) 358-7791. (213) 358-7792. (213) 358-7793. (213) 358-7794. (213) 358-7795. (213) 358-7796. (213) 358-7797. (213) 358-7798. (213) 358-7799. (213) 358-7800. (213) 358-7801. (213) 358-7802. (213) 358-7803. (213) 358-7804. (213) 358-7805. (213) 358-7806. (213) 358-7807. (213) 358-7808. (213) 358-7809. (213) 358-7810. (213) 358-7811. (213) 358-7812. (213) 358-7813. (213) 358-7814. (213) 358-7815. (213) 358-7816. (213) 358-7817. (213) 358-7818. (213) 358-7819. (213) 358-7820. (213) 358-7821. (213) 358-7822. (213) 358-7823. (213) 358-7824. (213) 358-7825. (213) 358-7826. (213) 358-7827. (213) 358-7828. (213) 358-7829. (213) 358-7830. (213) 358-7831. (213) 358-7832. (213) 358-7833. (213) 358-7834. (213) 358-7835. (213) 358-7836. (213) 358-7837. (213) 358-7838. (213) 358-7839. (213) 358-7840. (213) 358-7841. (213) 358-7842. (213) 358-7843. (213) 358-7844. (213) 358-7845. (213) 358-7846. (213) 358-7847. (213) 358-7848. (213) 358-7849. (213) 358-7850. (213) 358-7851. (213) 358-7852. (213) 358-7853. (213) 358-7854. (213) 358-7855. (213) 358-7856. (213) 358-7857. (213) 358-7858. (213) 358-7859. (213) 358-7860. (213) 358-7861. (213) 358-7862. (213) 358-7863. (213) 358-7864. (213) 358-7865. (213) 358-7866. (213) 358-7867. (213) 358-7868. (213) 358-7869. (213) 358-7870. (213) 358-7871. (213) 358-7872. (213) 358-7873. (213) 358-7874. (213) 358-7875. (213) 358-7876. (213) 358-7877. (213) 358-7878. (213) 358-7879. (213) 358-7880. (213) 358-7881. (213) 358-7882. (213) 358-7883. (213) 358-7884. (213) 358-7885. (213) 358-7886. (213) 358-7887. (213) 358-7888. (213) 358-7889. (213) 358-7890. (213) 358-7891. (213) 358-7892. (213) 358-7893. (213) 358-7894. (213) 358-7895. (213) 358-7896. (213) 358-7897. (213) 358-7898. (213) 358-7899. (213) 358-7900. (213) 358-7901. (213) 358-7902. (213) 358-7903. (213) 358-7904. (213) 358-7905. (213) 358-7906. (213) 358-7907. (213) 358-7908. (213) 358-7909. (213) 358-7910. (213) 358-7911. (213) 358-7912. (213) 358-7913. (213) 358-7914. (213) 358-7915. (213) 358-7916. (213) 358-7917. (213) 358-7918. (213) 358-7919. (213) 358-7920. (213) 358-7921. (213) 358-7922. (213) 358-7923. (213) 358-7924. (213) 358-7925. (213) 358-7926. (213) 358-7927. (213) 358-7928. (213) 358-7929. (213) 358-7930. (213) 358-7931. (213) 358-7932. (213) 358-7933. (213) 358-7934. (213) 358-7935. (213) 358-7936. (213) 358-7937. (213) 358-7938. (213) 358-7939. (213) 358-7940. (213) 358-7941. (213) 358-7942. (213) 358-7943. (213) 358-7944. (213) 358-7945. (213) 358-7946. (213) 358-7947. (213) 358-7948. (213) 358-7949. (213) 358-7950. (213) 358-7951. (213) 358-7952. (213) 358-7953. (213) 358-7954. (213) 358-7955. (213) 358-7956. (213) 358-7957. (213) 358-7958. (213) 358-7959. (213) 358-7960. (213) 358-7961. (213) 358-7962. (213) 358-7963. (213) 358-7964. (213) 358-7965. (213) 358-7966. (213) 358-7967. (213) 358-7968. (213) 358-7969. (213) 358-7970. (213) 358-7971. (213) 358-7972. (213) 358-7973. (213) 358-7974. (213) 358-7975. (213) 358-7976. (213) 358-7977. (213) 358-7978. (213) 358-7979. (213) 358-7980. (213) 358-7981. (213) 358-7982. (213) 358-7983. (213) 358-7984. (213) 358-7985. (213) 358-7986. (213) 358-7987. (213) 358-7988. (213) 358-7989. (213) 358-7990. (213) 358-7991. (213) 358-7992. (213) 358-7993. (213) 358-7994. (213) 358-7995. (213) 358-7996. (213) 358-7997. (213) 358-7998. (213) 358-7999. (213) 358-8000. (213) 358-8001. (213) 358-8002. (213) 358-8003. (213) 358-8004. (213) 358-8005. (213) 358-8006. (213) 358-8007. (213) 358-8008. (213) 358-8009. (213) 358-8010. (213) 358-8011. (213) 358-8012. (213) 358-8013. (213) 358-8014. (213) 358-8015. (213) 358-8016. (213) 358-8017. (213) 358-8018. (213) 358-8019. (213) 358-8020. (213) 358-8021. (213) 358-8022. (213) 358-8023. (213) 358-8024. (213) 358-8025. (213) 358-8026. (213) 358-8027. (213) 358-8028. (213) 358-8029. (213) 358-8030. (213) 358-8031. (213) 358-8032. (213) 358-8033. (213) 358-8034. (213) 358-8035. (213) 358-8036. (213) 358-8037. (213) 358-8038. (213) 358-8039. (213) 358-8040. (213) 358-8041. (213) 358-8042. (213) 358-8043. (213) 358-8044. (213) 358-8045. (213) 358-8046. (213) 358-8047. (213) 358-8048. (213) 358-8049. (213) 358-8050. (213) 358-8051. (213) 358-8052. (213) 358-8053. (213) 358-8054. (213) 358-8055. (213) 358-8056. (213) 358-8057. (213) 358-8058. (213) 358-8059. (213) 358-8060. (213) 358-8061. (213) 358-8062. (213) 358-8063. (213) 358-8064. (213) 358-8065. (213) 358-8066. (213) 358-8067. (213) 358-8068. (213) 358-8069. (213) 358-8070. (213) 358-8071. (213) 358-8072. (213) 358-8073. (213) 358-8074. (213) 358-8075. (213) 358-8076. (213) 358-8077. (213) 358-8078. (213) 358-8079. (213) 358-8080. (213) 358-8081. (213) 358-8082. (213) 358-8083. (213) 358-8084. (213) 358-8085. (213) 358-8086. (213) 358-8087. (213) 358-8088. (213) 358-8089. (213) 358-8090. (213) 358-8091. (213) 358-8092. (213) 358-8093. (213) 358-8094. (213) 358-8095. (213) 358-8096. (213) 358-8097. (213) 358-8098. (213) 358-8099. (213) 358-8100. (213) 358-8101. (213) 358-8102. (213) 358-8103. (213) 358-8104. (213) 358-8105. (213) 358-8106. (213) 358-8107. (213) 358-8108. (213) 358-8109. (213) 358-8110. (213) 358-8111. (213) 358-8112. (213) 358-8113. (213) 358-8114. (213) 358-8115. (213) 358-8116. (213) 358-8117. (213) 358-8118. (213) 358-8119. (213) 358-8120. (213) 358-8121. (213) 358-8122. (213) 358-8123. (213) 358-8124. (213) 358-8125. (213) 358-8126. (213) 358-8127. (213) 358-8128. (213) 358-8129. (213) 358-8130. (213) 358-8131. (213) 358-8132. (213) 358-8133. (213) 358-8134. (213) 358-8135. (213) 358-8136. (213) 358-8137. (213) 358-8138. (213) 358-8139. (213) 358-8140. (213) 358-8141. (213) 358-8142. (213) 358-8143. (213) 358-8144. (213) 358-8145. (213) 358-8146. (213) 358-8147. (213) 358-8148. (213) 358-8149. (213) 358-8150. (213) 358-8151. (213) 358-8152. (213) 358-8153. (213) 358-8154. (213) 358-8155. (213) 358-8156. (213) 358-8157. (213) 358-8158. (213) 358-8159. (213) 358-8160. (213) 358-8161. (213) 358-8162. (213) 358-8163. (213) 358-8164. (213) 358-8165. (213) 358-8166. (213) 358-8167. (213) 358-8168. (213) 358-8169. (213) 358-8170. (213) 358-8171. (213) 358-8172. (213) 358-8173. (213) 358-8174. (213) 358-8175. (213) 358-8176. (213) 358-8177. (213) 358-8178. (213) 358-8179. (213) 358-8180. (213) 358-8181. (213) 358-8182. (213) 358-8183. (213) 358-8184. (213) 358-8185. (213) 358-8186. (213) 358-8187. (213) 358-8188. (213) 358-8189. (213) 358-8190. (213) 358-8191. (213) 358-8192. (213) 358-8193. (213) 358-8194. (213) 358-8195. (213) 358-8196. (213) 358-8197. (213) 358-8198. (213) 358-8199. (213) 358-8200. (213) 358-8201. (213) 358-8202. (213) 358-8203. (213) 358-8204. (213) 358-8205. (213) 358-8206. (213) 358-8207. (213) 358-8208. (213) 358-8209. (213) 358-8210. (213) 358-8211. (213) 358-8212. (213) 358-8213. (213) 358-8214. (213) 358-8215. (213) 358-8216. (213) 358-8217. (213) 358-8218. (213) 358-8219. (213) 358-8220. (213) 358-8221. (213) 358-8222. (213) 358-8223. (213) 358-8224. (213) 358-8225. (213) 358-8226. (213) 358-8227. (213) 358-8228. (213) 358-8229. (213) 358-8230. (213) 358-8231. (213) 358-8232. (213) 358-8233. (213) 358-8234. (213) 358-8235. (213) 358-8236. (213) 358-8237. (213) 358-8238. (213) 358-8239. (213) 358-8240. (213) 358-8241. (213) 358-8242. (213) 358-8243. (213) 358-8244. (213) 358-8245. (213) 358-8246. (213) 358-8247. (213) 358-8248. (213) 358-8249. (213) 358-8250. (213) 358-8251. (213) 358-8252. (213) 358-8253. (213) 358-8254. (213) 358-8255. (213) 358-8256. (213) 358-8257. (213) 358-8258. (213) 358-8259. (213) 358-8260. (213) 358-8261. (213) 358-8262. (213) 358-8263. (213) 358-8264. (213) 358-8265. (213) 358-8266. (213) 358-8267. (213) 358-8268. (213) 358-8269. (213) 358-8270. (213) 358-8271. (213) 358-8272. (213) 358-8273. (213) 358-8274. (213) 358-8275. (213) 358-8276. (213) 358-8277. (213) 358-8278. (213) 358-8279. (213) 358-8280. (213) 358-8281. (213) 358-8282. (213) 358-8283. (213) 358-8284. (213) 358-8285. (213) 358-8286. (213) 358-8287. (213) 358-8288. (213) 358-8289. (213) 358-8290. (213) 358-8291. (213) 358-8292. (213) 358-8293. (213) 358-8294. (213) 358-8295. (213) 358-8296. (213) 358-8297. (213) 358-8298. (213) 358-8299. (213) 358-8300. (213) 358-8301. (213) 358-8302. (213) 358-8303. (213) 358-8304. (213) 358-8305. (213) 358-8306. (213) 358-8307. (213) 358-8308. (213) 358-8309. (213) 358-8310. (213) 358-8311. (213) 358-8312. (213) 358-8313. (213) 358-8314. (213) 358-8315. (213) 358-8316. (213) 358-8317. (213) 358-8318. (213) 358-8319. (213) 358-8320. (213) 358-8321. (213) 358-8322. (213) 358-8323. (213) 358-8324. (213) 358-8325. (213) 358-8326. (213) 358-8327. (213) 358-8328. (213) 358-8329. (213) 358-8330. (213) 358-8331. (213) 358-8332. (213) 358-8333. (213) 358-8334. (213) 358-8335. (213) 358-8336. (213) 358-8337. (213) 358-8338. (213) 358-8339. (213) 358-8340. (213) 358-8341. (213) 358-8342. (213) 358-8343. (213) 358-8344. (213) 358-8345. (213) 358-8346. (213) 358-8347. (213) 358-8348. (213) 358-8349. (213) 358-8350. (213) 358-8351. (213) 358-8352. (213) 358-8353. (213) 358-8354. (213) 358-8355. (213) 358-8356. (213) 358-8357. (213) 358-8358. (213) 358-8359. (213) 358-8360. (213) 358-8361. (213) 358-8362. (213) 358-8363. (213) 358-8364. (213) 358-8365. (213) 358-8366. (213) 358-8367. (213) 358-8368. (213) 358-8369. (213) 358-8370. (213) 358-8371. (213) 358-8372. (213) 358-8373. (213) 358-8374. (213) 358-8375. (213) 358-8376. (213) 358-8377. (213) 358-8378. (213) 358-8379. (213) 358-8380. (213) 358-8381. (213) 358-8382. (213) 358-8383. (213) 358-8384. (213) 358-8385. (213) 358-8386. (213) 358-8387. (213) 358-8388. (213) 358-8389. (213) 358-8390. (213) 358-8391. (213) 358-8392. (213) 358-8393. (213) 358-8394. (213) 358-8395. (213) 358-8396. (213) 358-8397. (213) 358-8398. (213) 358-8399. (213) 358-8400. (213) 358-8401. (213) 358-8402. (213) 358-8403. (213) 358-8404. (213) 358-8405. (213) 358-8406. (213) 358-8407. (213) 358-8408. (213) 358-8409. (213) 358-8410. (213) 358-8411. (213) 358-8412. (213) 358-8413. (213) 358-8414. (213) 358-8415. (213) 358-8416. (213) 358-8417. (213) 358-8418. (213) 358-8419. (213) 358-8420. (213) 358-8421. (213) 358-8422. (213) 358-8423. (213) 358-8424. (213) 358-8425. (213) 358-8426. (213) 358-8427. (213) 358-8428. (213) 358-8429. (213) 358-8430. (213) 358-8431. (213) 358-8432. (213) 358-8433. (213) 358-8434. (213) 358-8435. (213) 358-8436. (213)

Today, the
high performance
of COMPAQ
is more desirable
than ever.

Now, our new prices more attainable



The COMPAQ DESKPRO 286v PC and COMPAQ DESKPRO 386v PC are our most affordable desktops. Our smallest, too. They won't look big on your desk. Or your bottom line.



Weighing in at just 6.9 lb. and measuring just 6.5" x 11", the COMPAQ LITE 386 PC fits in most briefcases. And budgets.



The COMPAQ SLT 386/20 PC packs Intel 386SX performance and full functionality into a battery-powered laptop that is as affordable as it is powerful.



Our most popular desktops are now priced that way, too. From the COMPAQ DESKPRO 386v PC to the COMPAQ DESKPRO 386/25e PC.



The COMPAQ DESKPRO 486/33 PC is for the power user who simply refuses to compromise on anything.

are also making it than ever.



*At 8.5" x 11", no other
notebook packs more features
into a design as small as
the award-winning
COMPAQ LTE 386/20 PC.
With our new prices, why
carry anything else?*

*Serve more for less with the COMPAQ SYSTEMPRO PC
System. It brings unprecedented performance and
expansion to a wide range of connected environments.*

For everyone facing the challenge of doing more with less, help has arrived.

Because now, all the most popular COMPAQ personal computers and PC systems are more affordable than ever.

Our new prices mean that millions of people can now discover what millions of COMPAQ users already know: COMPAQ PCs simply work better.

At Compaq, "It simply works better" is not just a slogan. It's the goal behind every product (and every component of every product) we build.

Working better means designing products in response to people's needs, not our own. It means putting the latest innovations to work to enhance your investment in PC technology, not render it obsolete.

Working better means ensuring reliability and compatibility by subjecting our PCs to exhaustive testing. It also means supporting them the world over through our thoroughly trained dealer network.

Yes, our prices are now lower. But our standards are as high as ever. Just imagine the impact these two simple facts can have on your company.

Your Authorized COMPAQ Computer Dealer can provide you with complete pricing and product information. Or we can give you our suggested resale prices and the location of the dealer nearest you. Just call 1-800-231-0900, Operator 152. In Canada, 1-800-263-5868, Operator 152.

COMPAQ

It simply works better.

E-mail tool operates within 1-2-3

BY JIM NASH
CW STAFF

Electronic mail software is looking deeper into popular desktop applications. The latest example is Beyond, Inc.'s @Mail, an E-mail program that allows end users to send and receive mes-

sages without leaving their Lotus Development Corp. spreadsheets.

Casual users of spreadsheet programs said they see marginal advantage in Boston-based Beyond's "message from home" capabilities. But an analyst briefed by the company said that

with 14 million Lotus 1-2-3 users, the product is likely to find several million fans.

Based on Message Handling System (MHS), codeveloped by Novell, Inc. and Action Technologies, Inc., @Mail not only gives users the capability to send messages from an active spread-

sheet, it also allows them to pre-program spreadsheets to be mailed when a specified value is attained on the sheet.

David Atlas, senior analyst for electronic messaging at International Data Corp. in Framingham, Mass., said he knows of no other software package offering this kind of multitasking. Atlas estimated that there are 3 million to 4 million potential users

with both Lotus and MHS applications.

However, the software's benefit seems less attractive to users who "don't reside in [their] applications all day long," said Burt Lum, technical specialist at GT&H Hardware Telephone Co.

Likewise, Jim Beck, manager of electronic messaging at Credit Union National Association in Madison, Wis., said he rarely uses spreadsheet software. Beck said he does not mind having to back out of one program to pick up his mail. Both Beck and Lum agreed, however, that tightening the bonds between E-mail and applications is necessary.

@Mail is scheduled to ship next month. It costs \$129.95 for a single license and goes up to \$395 for an eight-user license.

How long will you have to wait for the ultimate solution to client/server computing?

Is Friday morning OK?

**SequeLink™
CLIENT/SERVER
PROPOSAL**

You've heard about client/server solutions from hardware, software and DBMS vendors. Now it's time to hear from the only client/server vendor in the industry.

Introducing SequeLink—the only way to bring all your data to where the action is your desktop. Choosing hardware and software standards is your business. Bridging those standards is our business—our only business.

For this ad only, call 1-800-321-4543 or call toll free: (800) 321-4543. You'll have the solution on your desk by Friday morning.

- | | | | | |
|----------------------------------|-------------------------------------|------------------------------------|------------------------------------|--|
| SERVER | DBMS | NETWORK | CLIENT | APPLICATIONS |
| <input type="checkbox"/> AS/400 | <input type="checkbox"/> ORACLE | <input type="checkbox"/> NETBIOS | <input type="checkbox"/> WINDOWS3 | <input type="checkbox"/> EXCEL |
| <input type="checkbox"/> VAX/VMS | <input type="checkbox"/> RDB | <input type="checkbox"/> TCP/IP | <input type="checkbox"/> MACINTOSH | <input type="checkbox"/> WINGZ |
| <input type="checkbox"/> UNIX | <input type="checkbox"/> INGRES | <input type="checkbox"/> DECNET | <input type="checkbox"/> UNIX | <input type="checkbox"/> EASEL |
| <input type="checkbox"/> MVS | <input type="checkbox"/> SYBASE | <input type="checkbox"/> APPC | <input type="checkbox"/> OS/2 | <input type="checkbox"/> HYPERCARD |
| <input type="checkbox"/> OS/2 | <input type="checkbox"/> DB2 | <input type="checkbox"/> APPLETALK | <input type="checkbox"/> | <input type="checkbox"/> TOOLBOOK |
| <input type="checkbox"/> VM | <input type="checkbox"/> SQL/400 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> 4TH DIMENSION |
| <input type="checkbox"/> | <input type="checkbox"/> SQL SERVER | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> SMALLTALK |
| <input type="checkbox"/> | <input type="checkbox"/> OS/2 DBM | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> INFORMIX | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

Client/Server MiddleWare™
SequeLink™

A product of TechGnosis, Inc.
301 Yamato Road, Suite 2200
Boca Raton, FL 33431
(800) 321-4543 or (407) 994-4958

Newspaper

FROM PAGE 65

bridges in the seventh-floor computer center. The sub-networks will each have 32 PS/2 Model 70 workstations and dual Model 80 servers.

Active news stories reside on the workstation, with the local servers periodically taking snapshots of stories in progress. When the Tandem goes down — about twice each year — reporters and editors will be able to continue working locally. Old and inactive stories reside on the Tandem.

Reporters can dial into commercial news and information services through a "modem pool" attached to the backbone, and they can also tap into a special server on the backbone holding commercial spreadsheets, database and graphics packages. Information and graphics from these sources can be downloaded for inclusion in stories.

Loker said the Post will also add a system that can scan incoming wire service stories for keywords and can route stories to reporters and editors based on interest profiles supplied earlier by those individuals.

Reporters at the Post's 17 U.S. bureaus will be able to dial up and go on-line or work locally on their PCs. "We wanted to make the bureau full citizens," Loker said.

Two Post departments will move to the new system on a trial basis this summer. Final implementation is scheduled for mid-1992. Loker declined to disclose what it will cost, other than to say it is "a huge number."

"Putting together a large network with off-the-shelf hardware is not easy," Loker said. But she added that it has gotten somewhat simpler since she abandoned an earlier plan to mix vendors in the network.

"We decided to go all IBM, even though that's more expensive. It's to reduce the number of variables," she said.

CW

THE FIRST THING
YOU SHOULD KNOW
ABOUT THE CONCEPT OF

ACE

IS THAT IT'S NOT JUST
A CONCEPT.

On April 9th, when Digital joined 21 other hardware and software vendors to form ACE (Advanced Computing Environment), it was a symbol of our continued commitment to open standards. The ACE initiative has developed a set of hardware and operating system standards for RISC computing. This will give customers the ability to

choose from tens of thousands of off-the-shelf applications for any ACE-compatible system.

Today, with the announcement of our DECstation™ 5000/100 Series workstation, Digital goes beyond symbol to reality. As a member of the DECsystem™ 5000 family, the

100 Series workstation is compatible with ACE standards by incorporating the MIPS® R3000 chip, little endian byte ordering and OSF™ technologies.

Besides providing hardware compatibility, ACE standards protect your investment in

ULTRIX™ applications and will allow you to take advantage of other products as they are developed by other

ACE members.

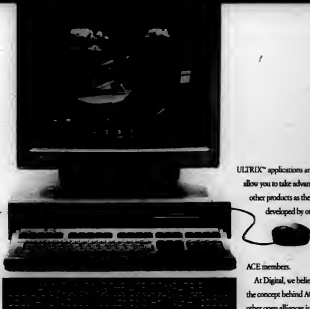
At Digital, we believe that the concept behind ACE and other open alliances is the key

to the future. And with our DECsystem 5000 family, the future is now. For more information, call 1-800-622-3677.

ADVANCED COMPUTING ENVIRONMENT

digital

DIGITAL. THE OPEN ADVANTAGE.



LEO BURNETT
IS SOLD ON ALL OF



ADVERTISING THESE NETWORKS.

Leo Burnett Advertising knows the value of selecting top-rated network programming for its clients. And for its computers.

So when Burnett's information services group decided on a PC-based network, they chose NetWare®, the only network operating system that's in its eighth generation. According to Bill Engelbrecht, executive vice president of administration, "The network we installed must take us beyond the year 2000. That's why we chose to align ourselves with the leader in networking."

Needless to say, long-term relationships are nothing new to Burnett. After all, Burnett has retained some of this country's premier advertisers for decades, growing into one of America's largest advertising agencies with billings exceeding \$3.2 billion.

"One of our strategic goals is global connectivity between the 49 offices we maintain around the world, and the ability to further improve communication with our clients," recalls Engelbrecht. "With NetWare, many of our clients have access to information on our network, giving us a competitive edge in account service."

Burnett's network, which was installed in just three days, spans 29 floors

to link 1,200 personal computers, integrate an IBM mainframe and provide remote connectivity. In fact, its advanced capabilities earned Burnett the Excellence Award from the Enterprise Networking Institute.

But beyond exceptional functionality and the industry's tightest security, NetWare offers something other solutions simply can't—compatibility with more applications, computing environments and hardware than any other network operating system.

So call 1-800-LANKIND for your NetWare Buyer's Guide. And learn how NetWare is helping make Leo Burnett a commercial success.



The Past, Present, and Future
of Network Computing.

Interface between T1, WAN in works

BY JIM NASH
OF STAFF

With federal approval for Switched Multimegabit Data Services (SMDS) seen as one year off, five networking vendors have proposed a standard interface between T1 and wide-area network devices.

Regional telephone companies are expected to receive government approval in 1992 to offer multimegabit services linking local-area networks over T1 and T3 lines across metropolitan areas. At least one potential user, however, noted that fiber communications would have to become much more popular before the services would be practical.

The nonproprietary interface introduced last week standardizes the way participating bridges and routers transfer data to and from data service and channel service devices. Data and channel service machines act as digital endpoints, pushing data over T1 and T3 lines.

The vendors proposing the interface include Ungermann-Bass, Inc.; Advanced Computer Communications, Inc.; Wellfleet Communications, Inc.; Verilink Corp.; and Digital Link Corp.

Some of the partners are either involved in or preparing trials with telephone companies such as Pacific Bell Telephone in San Ramon, Calif.

Gary Krall, director of marketing at Advanced Computer, said multimegabit services will offer users flexibility in using T1 lines. Users would only be billed

purchases, he said, as well as a larger universe of firms that can be contacted over the service.

Only two of the 120 offices of utility Pacific Corp. in Portland, Ore., are likely to have the traffic to justify buying the service, and even they are still wired with 10M bit/sec. Ethernet.

Art King, senior operating system analyst at Pacific, said that until fiber-optic data distribution is more prevalent, the service may find only a small market.

Liu said the new interface will attract some companies with its promised management of bridging, routing, T1 and T3 devices.

John DeVries, line manager for networking products at Microm Communications Corp., a competitor for the companies in the SMDS standards effort, played down the short-term impact of the proposed standard.

DeVries said the five companies involved are aiming at Fortune 500 firms. Microm markets Marathon, a tool for connecting LANs and WANs over 9.6K and 56K bit/sec. lines. DeVries said the larger market of medium-size companies is unlikely to make the jump to T1 lines because of this agreement.

MULTIMEGABIT SERVICES WILL offer users flexibility in using T1 lines.

GARY KRALL
ADVANCED COMPUTER

for installation, monthly service charges and use, he said, rather than the full dedicated-line costs whether or not the line is used.

Pacific Bell's multimegabit service project manager, Frank Liu, said users should be encouraged by the proposed standard. Liu said firms will be able to use equipment from all vendors adhering to the specifications. That means more flexibility in

ELS Netware licensed to Anthem's Eagle Technology

Company plans few changes for Level 1 software

BY JIM NASH
OF STAFF

PROVO, Utah — Having consolidated all of its low-end networking products into Netware 2.2, Novell, Inc. has decided to license its most basic product, ELS Netware Level 1, to a business unit of Anthem Electronics, Inc.

For an undisclosed amount, San Jose, Calif.-based Anthem will license ELS Netware Level 1, reselling it through the distribution company's new manufacturing unit, Eagle Technology. The move will have little impact, according to managers of ELS networks. Level 1 networks typically have four users.

Eagle plans to produce copies of the software, to be called Netware Starting System (NSS), without updates of its own, said Ken Lambeck, Eagle's vice president and managing director. Ladd Thompson, product line manager for Novell's Netware 2.2, said his company plans few changes for ELS Level

1 as a component in Netware 2.2.

NSS is available now and is bundled with coaxial cable T-connectors and two Ethernet adapter cards, which are also licensed from Novell. NSS will work only with the licensed cards and costs \$995 with Eagle's relabeled NE 1000 adapter card and \$1,155 with an IBM Micro Channel Architecture-based version.

Tammy McJunkins, president of McJunkins Tire Center in Monroe, La., said the news had little impact on his networking plans. "If my dealer can continue his level of support, I don't care where [ELS] comes from," McJunkins said. "Novell has been extremely good at improving the software and keeping the dealer up to date on the product."

He said as long as support does not suffer and improvements are made, he will be satisfied with the product. "I don't expect Novell to leave us high and dry. I don't think that they can afford to."

Ch Ch



Have you noticed the way networks attract more and more hardware as they change?

It's a bridge box here. A router box there. A brouter box here.

Costly devils.

Which is why we've built NETBuilder.* It lets you switch from bridging to routing to brouting by changing a single software diskette. The hardware stays the same.

To simplify matters even more, NETBuilder's bridge, router and brouter have the same menu-driven user interface. So there's a common look and feel. Yet, you can still create custom menus to suit a particular network environment.

As a result, NETBuilder cuts three big expense items in internetworking—new hardware purchases, and the training and servicing to support it.

Yet, you sacrifice nothing for this simplicity.

Online NCS completes Chipcom puzzle

BY CHRISTOPHER LINDQUIST
CW STAFF

SOUTHBORO, Mass. — Chipcom Corp. recently announced what it is calling the "final piece of the puzzle" for building and managing its fault-tolerant networks.

The Simple Network Management Protocol (SNMP)-based Online Network Control System (NCS) reportedly allows users to manage and reconfigure a Chipcom network or group of networks using software rather than hardware.

For example, network managers using the product could reassign individual Ethernet or Token Ring connector modules to any of three logical networks within a Chipcom concentrator to balance traffic loads, without having to go to a wiring closet and change cables.

This is possible because Chipcom concentrators use the firm's Trichannel architecture, which allows up to three networks to be run simultaneously in a single concentrator. "Because Synopsys [Communications, Inc.] and Cabletron [Systems, Inc.] don't have multiple Ethernet buses in

their hubs, they can't do this," said Michael Howard, president of Infonetics Research Institute, Inc., a computer research and consulting firm in San Jose, Calif.

The system can also be configured to run scripts to perform certain tasks, such as paging the warnings are received, ensuring the need for a full-time operator. Cabletron's Spectrum system was more versatile in this regard than Online NCS but cost a lot more, starting at about \$50,000,

Howard said. "At the pricing level that we're talking about here from Chipcom, you cannot buy that from Cabletron."

Online NCS was built under The Santa Cruz Operation's Open Desktop environment, which includes Unix System V, an Ingres Corp. relational database management system and the Open Software Foundation's Motif graphical user interface. The point-and-click interface allows network managers to click on color-coded icons within a

graphical "map" of the network to zoom in on problem areas. They can also perform actions such as enabling and disabling specific ports in a concentrator graphically.

Online NCS runs on 386- and Intel Corp. 486-based computers. A license to use the system on as many as 12 Online system concentrators costs \$6,500. A license for 13 or more concentrators costs \$12,500. The product is expected to be available in 60 days.

Supernet aids super users

SAN DIEGO — Providing a pit stop of sorts for users of high-speed computers, a group of vendors is backing an information exchange for this elite systems community.

The vendors are joining together to take part in what they emphasize is a noncommercial forum presented through a monthly technical journal and an on-line bulletin board.

Called Supernet, the forum will first appear in *Supercomputing Review Magazine*.

Supernet will contain free information listings and services, as well as provide information on research projects, job listings, user feedback on software and hardware and listings of user-group meetings.

Sponsors are high-performance computing firms, including Alliant Computer Systems, Corp., Convex Computer Corp., Cray Research, Inc., Digital Equipment Corp., IBM and Intel Corp. Plans for Supernet call for creation of an on-line electronic mail version of the forum and an international directory of high-performance computing users.

Escort adapter to link sites to network

EATONTOWN, N.J. — Integrated Services Digital Network (ISDN) equipment vendor Telex Communications, Inc. recently introduced an ISDN terminal adapter designed to provide primary rate access to high-speed data services.

Telex is promoting the Escort adapter as a means to link small, remote sites to a corporate network via public switched digital services. Escort is intended to support remote sites dedicated to a single network application, while the earlier Telex IAP6000 Access Server was designed for use at larger corporate locations with high-volume multimedia traffic. Potential applications for Escort include videoconferencing and private line backup.

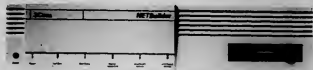
Telex said Escort has been tested for compliance with AT&T Accumet services and that it has an optional integrated channel service unit for direct connection to a T1 line.

Escort is slated for delivery in

June for \$5,900 per unit.

In another recent development, Telex acquired Vadis, Inc.'s personal computer adapter product line. Vadis exited the ISDN PC adapter card market last June, reportedly because the market had reached only 10% to 15% of the company's expectations. Vadis' equipment is IBM Micro Channel Architecture-based and should thus complement Telex' existing IBM Personal Computer XT/AT-compatible adapter.

Ch Changes.



NETBuilder's bridging, routing and brouting offer top performance for local area connections and wide area connections.

The result is modular internetworking that lets you manage changes on your network intelligently.

But why not see for yourself? Just call 1-800-NET-3Com Dept. D5057. You'll find the more things change on your network, the more they can stay the same.

3Com

We network more types of systems to more types of systems.™

© 1990 3Com Corporation, 5400 Bayfront Plaza, Santa Clara, CA 95052 Telephone (408) 704-3000
3Com, NETBuilder and the 3Com logo are trademarks of 3Com Corporation.

McData controller to sport swap-in, swap-out design

BY JOANIE M. WEKLER
CW STAFF

BROOMFIELD, Colo. — Channel-attached and remote host controllers will soon be graced with the investment-protecting modular design that is easily fueling the intelligent wiring hub market.

McData Corp. said it will announce today a controller family, slated to ship June 3, that adds Ethernet and Token Ring integration, multiple host support and peer-

to-peer communications to the traditional 3270 terminal cluster controller functionality of its previous generation 4174 IBM host-compatible controller.

McData's Linkmaster 7100 Network Controller allows the customer to buy a chassis and change its character by swapping boards in and out — an investment-protection play that has until now eased the IBM channel-attached networking environment.

McData's 7100 could usurp IBM's

3174 Establishment Controller in price and features, according to users and analysts. Jeffrey Whitlow, a telecommunications systems engineer at First Colony Life Insurance Co. in Lynchburg, Va., said he has been beta-testing the 7100 because his company's applications are driving the firm to replace its 700 stand-alone dumb terminals and personal computers with local-area networks and intelligent workstations.

The 7100, he explained, accommodates his growing variety of computing and networking environments and "is a whiz to configure. I had the 7100 on-line and in production mode in 25 minutes. By comparison, IBM's 3174 took an hour and a half."

Whitlow explained that the time differ-

ential is important to his business because users are constantly changing departments and projects.

IBM has yet to announce Ethernet connections for its controllers. The 3172 Establishment Controller, IBM's device for heterogeneous environments, supports local channel attachments only, and its local and remote 3174 still caters to IBM's proprietary Systems Network Architecture (SNA) protocols.

McData is making a bold move in leapfrogging IBM and replacing the 3174," commented Cindy Santichiro, a senior research analyst at Framingham, Mass.-based International Data Corp. She said that the 7100's pricing is "right in line" with IBM's 3174, but the 7100 lets users send SNA traffic over Ethernet, increases the number of IBM hosts supported from one to two and allows IBM 3270 terminals to access Digital Equipment Corp. VAX hosts.

"I'm getting 64 ports from McData for less than what I'd pay for 32 ports on an IBM 3174," Whitlow added.

McData's 7100 prices range from \$5,635 to \$29,935; all models provide a direct link to Netview, IBM's enterprise network management system. Connections to fiber-based Enterprise Systems Connection hosts are slated for 1992.



Introducing the information system that reverses a time-honored proverb.

The quantity of information at your disposal is increasing at an astronomical rate. Unfortunately, that's also true of the knowledge and dollars required to access it.

So Dow Jones has created a system that simply removes those barriers. Its called DowVision™ and it does what no information system has ever done. It eliminates your search. For a fixed monthly fee, we'll gather, edit and automatically feed your company just the news it needs. Vial, real-

time news from Dow Jones News Services, the preeminent publisher of business and financial news.

By working with software developers—ARTS, Desktop Data, GSCAN, AGS, Verity ISS and Ensemble, among others—we can customize a system for your company based on its information needs. Each employee can get a separate profile, too.

Let's say you're interested in the chemical industry. All day long, we'll deliver just the related stories right to

your desktop computer. No müss. No fuss. No search.

And you'll be on the job with a head full of useful facts and a head start on your competition.

Which reverses another time-honored proverb: Quick and steady wins the race. For more on DowVision, call 1-800-522-3567, Ext. 256. In N.J., call 1-609-520-8349, Ext. 256.

DOWVISION™
The likelihood of business.™

Future belongs to wireless gear

BY CHRISTOPHER LINDQUIST
CW STAFF

PARSIPPANY, N.J. — A Golden Age of wireless for both voice and data communications equipment should be well under way by 1995.

A recent report by research firm The Insight Research Corp. predicted sales of wireless voice and data equipment, such as wireless private branch exchanges (PBX) and local-area networks, will increase rapidly over the next few years, with voice communications equipment sales growth eventually outstripping that of data equipment.

This will happen despite the current industry trend for data equipment sales growth to be greater than that of voice equipment by a wide margin — 25% compound annual growth for data vs. 7.5% for voice, according to the report.

Trend reversed

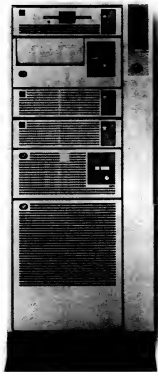
This trend reversal will be caused in part by the rapid acceptance of wireless analog telephones connected to PBXs and key systems, the study said. The trend is expected to accelerate once vendors begin to supply cordless digital telephones.

Conversely, wireless data technology will find a more difficult road ahead. Most companies planning on moving within the next five years will find their new buildings suitably prepared for standard wiring, limiting the opportunities for wireless data equipment.

Figures from the report stated that wireless LAN equipment sales will grow from \$79 million in 1991 to \$235 million in 1995, a compound annual growth rate of more than 31%. Similarly, sales of wireless PBXs and key telephone systems are expected to increase at a compound annual rate of 50%, from \$34 million in 1991 to \$171 million in 1995.

**What do you get if
your company needs
a computer that's
bigger, faster,
more connectable,
easier to grow,
easier to manage and
less expensive
than the
IBM AS/400?**

**The new,
bigger, faster,
more connectable,
easier to grow,
easier to manage and
less expensive
IBM AS/400.**



NEW PRODUCTS

Host-to-host

Emulex Corp. has announced a low-end Ethernet network server, the Performance 2500.

Four- and eight-port versions are available. The Performance 2500 supports Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Local Area Transport protocol. Modem control is possible at all ports. This Ethernet and 10Base-T adapters are available as options.

The four-port Performance 2500 is priced at \$1,650; the eight-port version costs \$1,995.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 663-5600

Ungermann-Bass, Inc. has introduced a software product that provides end-user connectivity to Tandem Computers, Inc. hosts via UB smart hubs.

With the product, terminals, personal computers and Apple Computer, Inc. Macintoshes can be connected over Ethernets, broadband and Fiber Distributed Data Interface networks using Transmission Control Protocol/Internet Protocol.

The Tandem connectivity product will be shipped to current UB support customers free of charge. The AccessOne smart hub with five slots costs \$2,095.

Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 95054
(408) 496-0111

Gateways, bridges, routers

Crystal Point, Inc. has announced Outside View, an OS/2-based software package that allows connectivity to hosts, networks and stand-alone personal computers using a variety of I/O channels.

Outside View supports asynchronous communications via modems, direct serial links and local- and wide-area networks under several transfer protocols. It features a macro programming language and supports Dynamic Data Exchange.

A stand-alone copy costs \$349; networking versions are available.

Crystal Point
Suite 148
22122 20th Ave. SE
Bothell, Wash. 98021
(206) 487-3656

Wide-area networking hardware

Datality, Inc. has begun shipping an upgraded X.25 packet assembler/disassembler (PAD) card for the company's VCP-1000 communications platform.

The VCP-1000 interconnects Unix systems, Digital Equipment Corp. plat-

forms and IBM hosts, X.25 networks, personal computer modems and other devices. The 16-MHz X.25 PAD card offers a 60% performance improvement over previous models, according to Datality. It provides 64 virtual circuits with transmission rates of up to 64K bit/sec.

The card costs \$3,199.
Datality
1118 First
322 Eighth Ave.
New York, N.Y. 10001
(212) 807-7800

Electronic data interchange

Prime Factors, Inc. has released Compact/EDI and Compact/PC, mainframe and personal computer software intended to reduce the cost of electronic data interchange (EDI) through data compression.

Compact/EDI yields compression rates of up to 5-to-1 for batch and real-time applications data.

It is independent of a mainframe operating system. Pricing starts at \$3,000, depending on processor.

Compact/PC can be purchased as a complete application for file compression and decompression or in ANSI C language for integration into custom applications.

It is compatible with the mainframe version. A license fee for both versions costs about 25% more than Compact/EDI.

Prime Factors
1470 E. 20th Ave.
Eugene, Ore. 97403
(503) 345-4334

Patrick Franz Consulting has created a low-cost electronic data interchange (EDI) software package for personal computers running DOS.

X-Caliber EDI offers standard functions including communications, reporting, data mapping and security features. It is intended to make EDI capability cost-effective for smaller businesses. X-Caliber EDI costs \$450. An introductory price of \$250 is offered until June 30.

Patrick Franz Consulting
Suite 205
204 E. Jefferson St.
Syracuse, N.Y. 13202
(315) 478-4011

ACS/Premonex, a division of Premonex Corp., has announced a fourth-generation language for accomplishing electronic data interchange (EDI) tasks.

ED/E generates scripts for translation, enveloping and routing for a user-specified EDI task. The scripts can be customized using the E language.

The product will initially be available for the IBM AIX and AT/AT Unit System V platforms. Pricing ranges from \$25,000 to \$65,000.

ACS/Premonex
Suite 200
1000 Burnett Ave.
Concord, Calif. 94520
(415) 602-3000

Local-area networking hardware



Suboctek's adapters link desktop computers to Ethernet and Arcnet networks

Selectek Corp. has created a line of adapters for linking portable and desktop computers to Ethernet and Arcnet networks.

The Model LAN-10BT (\$499.95) connects to 10Base-T networks using standard RJ45 telephone jacks. The Model LAN-CX (\$499.95) connects to thin Ethernet and 10Base-2 systems over coaxial wires. The Model LAN-ARC (\$399.95) provides connectivity with Arcnet.

Each adapter weighs 3 1/4 ounces and includes software drivers for Novell, Inc.'s Advanced Network 386 and Netware 386, Transmission Control Protocol/Internet Protocol and 3Com Corp.'s 3+Share.

Selectek
Suite 109
6370 Nancy Ridge Drive
San Diego, Calif. 92121
(619) 450-1220

Cnet Technology, Inc. has announced two Ethernet adapter cards for Extended Industry Standard Architecture (EISA) bus-based servers and workstations.

The CN950E supports thick and thin coaxial and shielded twisted-pair 10Base-T cabling and costs \$599. The CN900E, a model without shielded twisted-pair support, costs \$549. Both models include software drivers and transfer data at a rate of 10M bit/sec.

Cnet Technology
2199 Zanker Road
San Jose, Calif. 95131
(408) 954-8000



You don't own a power plant for your electricity...

Why own a data center for your information systems?

Why company's business to your focus.

Overseer your computing requirements to Martin Marietta, a Fortune 100 corporation, and you're in control of the resources you need when you need them. We're here providing computing systems for the federal government and corporate clients for more than 20 years. Our strategic data centers are accessible, scalable and added to your personal needs to retain your needs.

FOCUS...
A Large Hospital Association... depends on us to provide over half of its members with access to telecommunications, databases, and technical consultation for the design, integration, and implementation of the computer network.

FLEXIBILITY...
A Major Electronic Supplier... uses us for obtaining an data center. Martin Marietta, the company, for the computer resources it needs now and can increase or decrease indefinitely with financial cost impact.

Martin Marietta
Your Outsourcing Partner

RESPONSIVENESS...

A Federal Government Agency... Martin Marietta provides a secure, nationwide teleprocessing service. The U.S. governmental industry relies on us for its business information processing.

RESOURCES...

A Major Glass Packaging Company... uses a Fortune 500 company without a main site, when on Martin Marietta for its major information processing.

AND YOU...

should talk with a Martin Marietta representative and find out how we can help you concentrate on your business.

CHUBBY

Chubb's V.A. (714) 802-5444
Philadelphia, PA (215) 961-1225
Atlanta, GA (404) 524-1120
Los Angeles, CA (310) 556-5588

MARTIN MARIETTA

INFORMATION SYSTEMS
4700 Madison West Lane
Cherry Hill, NJ 08001

REXX

For Unix

XEDIT too...

Order anti-REXX and anti-XEDIT today.

The Workstation Group

6300 N. River Road
708-696-4800

Rosemont, IL 60018
800-228-6286



SCIENTIFIC AMERICAN

presents
the September 1991
single topic issue

Communications, Computers and Networks

For the past 41 years, *Scientific American* has devoted one issue each year to an in-depth look at a single topic. This year, the single topic issue will provide the definitive look at networks and networking and the products and services of the communications industry.

The articles will be written by such leading scientists and industrialists as Michael Dertouzos, Alan Kay, Sen. Albert Gore, Mitchell Kapor, Vinton Cerf, Irwin Jacobs, Andrew Viterbi, Lawrence Tesler, Mark Weiser, John Seely Brown, Nicholas Negroponte, Lee Sproull, Ann Branscomb and Thomas Malone.

**Advertisers can expect profound and widespread interest
among people of influence.**

A BONUS OF INFLUENTIAL READERS FOR ADVERTISERS:
"Communications, Computers and Networks" will be retained and referred to. And advertisers will benefit from the substantial circulation and readership bonuses that *Scientific American's* single topic issues always deliver.

Scientific American readers...

• 70% are managers or professionals

• 81% are college graduates

• 57% are involved in purchasing computers, software and peripherals

**CLOSING DATE:
JULY 10, 1991**

**MATERIALS DUE:
JULY 19, 1991**

• 86% use computers at work

• 39% work for companies that use networking software

**MAKE YOUR ADVERTISING PART OF THIS EXTRAORDINARY
SHOWCASE!** For further advertising information, contact your
local sales representative or:

Robert E. Gregory, Advertising Director, *Scientific American*,
415 Madison Avenue, New York, NY 10017, 212-754-0522

Source: Computer Subscriber Survey conducted by Simmons Market Research Bureau, March 1990

Before you do Windows
sit down and talk to some c
who've already done th

Computerworld's
Strategic Applications Seminars
Windows World in Atlanta

Computerworld's Strategic Applications Seminars, Windows World in Atlanta, is a unique opportunity for you to learn from the people who've already done it. And, you'll get a chance to win dinner for two at Windows on the World.

A Unique Opportunity to Learn from Windows Users

At Windows World, Computerworld's Windows World show, you'll get a chance to learn from the people who've already done it. And, you'll get a chance to win dinner for two at Windows on the World. All told by the people who've already done it. All told by the people who've already done it.

And a Chance to Win Dinner for Two at Windows on the World

At Windows World, Computerworld's Windows World show, you'll get a chance to learn from the people who've already done it. And, you'll get a chance to win dinner for two at Windows on the World.



ows,
colleagues
eirs.

Computerworld's
Strategic Application Seminars
Booth 3352, West Hall
May 20, 21, 22, 23
1:30 and 5:00 p.m. each day

at the top
with
COMPUTERWORLD

Maybe you should
stop committing
so much to memory.

MANAGER'S JOURNAL

EXECUTIVE TRACK



Clifford R. Hall has been named vice president and chief information officer of **Manville Corp.'s** Information Services Division in Denver, where he will be responsible for the overall direction and strategy of the division.

Previously, Hall had been an officer of United Telecommunications, Inc., the parent company of U.S. Sprint Communications Co., since 1989. He served as U.S. Sprint's executive vice president and chief information officer from 1987 to 1989.

Hall began his information services career in 1963 at Pacific Northwest Bell. He joined GTE Corp. as a systems analyst and spent 19 years there, becoming GTE's director of information management in 1984.

He holds a bachelor's degree in quantitative methods from the University of Washington and an MBA from the University of Chicago.

Randy Dieterle has been named vice president and CIO of PRC, Inc., a McLean, Va.-based systems integrator and a subsidiary of Black & Decker Corp. in Towson, Md. Dieterle's responsibilities will include developing and implementing corporate information systems strategies for PRC, formerly known as Planning Research Corp.

Dieterle was previously executive vice president at Palo Alto, Calif.-based Neuron Data, Inc., a developer of expert systems software.

Before that, he was vice president of U.S. systems and support at Oracle Corp. in Belmont, Calif.

He has an MBA from Pennsylvania State University.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your photo relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

An IS approach to managed care

Blue Cross' new cost-controlled health care focus is backed by integrated claims system

BY MARYKATH JOHNSON
OF STAFF

After six years of dwindling market share and increasingly ferocious competition, the health insurance empire of Blue Cross/Blue Shield of Massachusetts is striking back with information technology.

The state's largest health insurer, with 2.25 million subscribers, Boston-based Blue Cross is shifting its business focus from traditional indemnity insurance to the cost-controlled world of "managed health care," where health maintenance organizations (HMO) and similar groups offer benefit package tailored to hospitals, businesses or individuals.

"The overall strategy and direction of the company has been this commitment to become a managed care company," says Max Ward, vice president of production services, which manages the computer systems and networks at Blue Cross. "Our relationships with the health care providers are changing. They want more services and greater choices

among those services."

Information technology is aiding and abetting this effort through the organization's move to an integrated claims processing system, which gives hospitals and health care providers increased access to Blue Cross applications such as those dealing with Medi-

cal hospitals. Rather than rolling out a network of IBM terminals so those hospitals could tap directly into the insurer's database, the department recently installed a fault-tolerant system from Stratus Computer, Inc. to serve as a kind of "come one, come all" network communications switching point for the

600,000 transactions that flow in every week.

"Blue Cross is a kind of medical intermediary, and our applications are available on a dial-up basis now," Ward explains. "Once they connect over the Stratus, they will have the ability to go to any application internally."

The first hospitals will start connecting this summer, and eventually the entire network will have access through the Stratus machine, adds George P. Mey, director of provider automation services. "All the hospitals with terminals will have functionality they didn't have before, such as access to our benefit management applications."

More importantly, each hospital can use its own equipment to connect with the Stratus machine, through Stratus' *Continued on page 33*



Blue Cross' Ward, left, and Mey use IS to respond to a changing relationship with health care providers

care information.

For example, Blue Cross' provider automation department chose a novel method to keep in touch with its most important customers, the state's 140

Sabbaticals: Hit the road, Jack

BY JAMES DALY
OF STAFF

Information systems managers have discovered that sometimes the best thing to do for employees is to get rid of them — temporarily.

The company sabbatical, a corporate perk that prospered in the excesses of the 1980s, is still flourishing as a way to attract the best and the brightest.

"Employees are facing a shrinking talent pool, and sabbaticals often serve as a very powerful enticement tool," said Lane Ringler, a consultant at benefits consulting firm Hewitt Associates in Lincolnshire, Ill.

Major institutions such as Xerox Corp., McDonald's Corp., IBM and Apple Computer, Inc. all offer longtime

employees the chance to get away from routine workday concerns to chase a curiosity or pursue an obsession. Typical sabbaticals last anywhere from several weeks to several months.

Phyllis Jones, a systems analyst at Wells Fargo & Co. in Oakland, Calif., recently spent three months returning to the roots of her Native American heritage. She studied Navajo rug weaving on the New Mexico reservation where she grew up.

Jones swrote early each morning to gather the roots and plants used in creating vibrant dyes for the rug wool and worked closely with her mother to learn the ancient art. At the end of her leave, her achievements were three rugs and a renewed sense of personal confidence and corporate spirit.

"I surprised myself at how much I could accomplish," she said. "The com-

pany gave me a great opportunity, and it's made me even more dedicated to do the best I can for them."

While sabbaticals may refresh tired minds and bodies, benefits consultants strongly emphasize that leave takers preplan as much of their sabbatical as possible. Job security, travel expenses, raises, continuation of insurance benefits and vacation accrual are among the issues that should be clarified ahead of time.

There is a downside: With a key IS employee gone, for example, a department can lose momentum and a major project. Employees may also face jealous colleagues, turf battles or a crushing backlog of work when they return.

The trade-off, however, is a powerful competitive tool that can recharge the battery of a company veteran.

"It was a wonderful experience," Jones said. "The fact is, I'm looking forward to my next one."



CALENDAR

The National Conference for Artificial Intelligence will be held in Anaheim, Calif., July 14-19.

Keynote speakers will be Saul Amarel, the Alan M. Turing professor of computer science at Rutgers University, and Robert Kahn, president of The Corporation for National Research Initiatives.

For more information or to register, contact The American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

JUNE 9-15

Computer Security Institute, Denver, June 10-13 — Contact: Computer Security Institute, San Francisco, Calif. (415) 367-7801.

Experts on Networks, Washington, D.C., June 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FOBI Executive Symposium, Smyrna, Calif., June 11-12 — Contact: Joe Marie McFarlane, Evans Management International, Menlo Park, Calif. (415) 654-4705.

8th Steps for Success, Austin, June 11-13 — Contact: Shaw Stone, Indiana, Adams, Ga. (404) 220-3885.

Strategic Planning for Information and Systems, Chicago, June 12-14 — Contact: Barnett Data Systems, Redville, Mo. (301) 783-1288.

Windows 3.0 Developers Conference, Tyngsboro, Mass., June 13-14 — Contact: Andrew Potvin, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 449-9731.

The Byrd User Group, Olathe, Pa., June 13-14 — Contact: Christine Sells, Byrd Corp., Seaford, Mass. (508) 489-0840.

JUNE 16-22

Office Automation Society International Educational Conference, Alexandria, Va., June 16-18 — Contact: OAS, McLean, Va. (703) 821-6055.

National Educational Computing Conference, Phoenix, June 16-20 — Contact: Southwest Press, Scottsdale, Ariz. (602) 991-5121.

Classics of 1991 International User Conference, Cincinnati, June 16-20 — Contact: CCI Systems, Inc., Cincinnati, Ohio (513) 462-2306.

MIT Center for Information Systems Research Summer Institute, Cambridge, Mass., June 17-23 — Contact: CISR, Cambridge, Mass. (617) 353-6657.

Teaching Computer Software, Washington, D.C., June 17-20 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

Engineering Systems Design and Analysis Conference, Montreal, Quebec, June 17-20 — Contact: The American Society of Mechanical Engineers, Dallas, Texas (214) 640-6991.

Imaging at Work '91, Tyngsboro, Mass., June 17-20 — Contact: Andrew Potvin, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 449-9731.

International Trade Computerization Conference, Washington, D.C., June 18-19 — Contact: NCTED, New York, N.Y. (212) 925-1405.

Videoconferencing Industry Association Conference and Exposition, Washington, D.C., June 18-21 — Contact: Delta Trade, Vancouver Industry Association, Silver Spring, Md. (301) 495-4995.

Developing in the Computer Industry: Making the Integration from Business to Microelectronics to Distributed Processing in the Mainframe, PC and LAN Environment, New York, June 19-20 — Contact: Institute for International Research, New York, N.Y. (212) 824-1366.

Intervent '91, Hong Kong, June 19-20 — Contact: International Talent, McLean, Va. (703) 556-7778.

NEP Working Group Meeting, Mishawaka, Ind., June 19-21 — Contact: Joe West, IBM, Mishawaka, Ind. (219) 351-2454.

Supercomputing 1991, Mesa/Pasadena, Santa Clara, Calif., June 19-21 — Contact: John Derynny, Angus & Bates, Inc., Redwood City, Calif. (415) 363-6962.

Meet Week '91, Ann Arbor, Mich., June 19-23 — Contact: Conference Management Experts, Inc., Grand Prairie Park, Mich. (313) 882-1824.

Document Image Processing Symposium, Toronto, June 20-21 — Contact: C.I. News, Price Waterhouse, Toronto, Ontario (416) 562-1125.

JUNE 23-29

Structuring Business Partnerships for Competitive Advantages, Laguna Hills, Calif., June 23-25 — Contact: AME International, Inc., Greenwich, Conn. (203) 641-0011.

Conference on Communications, Denver, June 25-26 — Contact: IEEE, Northington, Ohio (603) 452-6111.

International Communications Association Summer Progress, Boulder, Colo., June 25-28 — Contact: ICA, Dallas, Texas (214) 225-3889.

Seasp East Conference, East Rutherford, N.J., June 24-27 — Contact: Bob Decker, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 449-9731.

Test Engineering Conference, Atlanta, June 24-27 — Contact: Miller Presson Equations, Boston, Mass. (617) 333-3976.

International Windows 3.0 Developers Conference, Santa Clara, Calif., June 24-28 — Contact: Andrew Potvin, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 449-9731.

Taking Control of the Future: The Role of Information Management in Business Reengineering, Nashville, June 25 — Contact: Lisa Gilman, Computer Corporation of America, Cambridge, Mass. (617) 495-8800.

Altera '91: Affordability, Security and Productivity of Micro-based Systems, Boston, June 25-27 — Contact: Pamela Bowers, MIT Training Institute, Framingham, Mass. (508) 879-7505.

MathWeek '91, London, June 25-27 — Contact: Acute Software, NGA, London, England (011-44) 081-743-3884.

PC Expo, New York, June 25-27 — Contact: Mark A. Rivard, Irvine Business, Inc., Englewood Cliffs, N.J. (201) 560-8512.

Hammer Purses and Clocks '91, Boston, June 26-29 — Contact: Hammer and Clock, Cambridge, Mass. (617) 354-5555.

Independent Computer Consultants Association National Conference, Seattle, June 27-29 — Contact: Carolyn Kessler, Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

6000 family. for all your applications.



CATIA™ and AES. Also available are a broad spectrum of solutions from vendors like Valid Logic, MacNeal Schwendler, Swanson Analysis, SAS Institute, SPSS, Wavefront, Alias, Pughen, Cadence, Fluid Dynamics International, Western Atlas, ECL Petro and create.X. Scientific and technical applications are available in areas like physics, structural analysis, chemistry, securities trading, mathematics, earth resources, operations research, visualization, graphics, technical publishing and more. There's also accounting software like FourGen and support for leading UNIX™-based office automation packages. And there are key industry applications for businesses in medical groups, retail stores, newspapers, pharmacies and many more.

Command enormous processing clout.

The RISC System/6000 family is built to boost the performance of the software power seekers use most. It's got the best floating point processor in the business for numerically intensive applications, plus a new superscalar processor and incredible 3D graphics capabilities. To find out more, call your IBM marketing representative or IBM Business Partner For literature, call 1 800 IBM-6676, ext. 990.



For the Power Seeker.

IBM

SIM award goes local

BY CLINTON WILDER
CW STAFF

MADISON, N.J. — The New Jersey chapter of the Society for Information Management (SIM) has brought the concept of "Think globally, act locally" to

the world of information systems awards.

Earlier this month, the chapter presented the first New Jersey SIM Partners in Leadership Award to two executives from Newark, N.J.-based Mutual Benefit Life Insurance Co. It is the

first local SIM chapter to develop its own version of the prestigious international SIM award, given each fall to two pairs of IS and business partners for innovation and leadership in applying IS to business.

The New Jersey winners were Mutual Benefit Life's Keith T. Glover, senior vice president of individual insurance administration, and June Marcano

Drewry, senior vice president of IS. The two executives led the re-engineering of writing and processing new insurance policies at the \$13 billion firm.

Glover and Drewry have also been nominated for the international SIM award. Winners will be honored at SIM's annual conference in Chicago in October.

"The New Jersey chapter is pretty active and subscribes

strongly to the business/IS partnership concept," said Paul Berger, a founder of the chapter and a member of the award selection committee. "We felt that there are a lot of strong companies in New Jersey and wanted to spread the concept, so we decided to have our own local version."

Berger, president of Paul Berger Consulting in Lawrenceville, N.J., noted that the chapter's award nomination process and selection criteria are identical to those for the international award. The selection committee consists of IS and business executives, consultants and academics.

Glover and Drewry received the award at the chapter's regular monthly meeting May 9. John Owens, president-elect of SIM, attended the meeting. Owens, now chief information officer at Carrier Corp. in Farmington, Conn., was a co-winner of the inaugural SIM Partners in Leadership award in 1987, when he was the top IS executive at Sears Roebuck & Co.'s Hosiery Division in Winston-Salem, N.C.

While Others Romance You...



Encore Knows How To Talk "Dirty"!



...and we get problems. Dirty Problems.

Dirty problems that make a superboy seem like a small burst of light. You could get the slide show treatment and try to figure out why you need twelve million dollars for a new mainframe.

...and you can call Encore. Open systems and standards performance at minicomputer prices... and the highest IBM mainframe prices. And... we know the nuts and bolts of complex and large systems. "And... 15 million... DARPA contracts for 30 years... we've provided elegant solutions to the most demanding applications in the world.

Call 1-800-933-6267

in the U.S.A. and Canada
305-587-7900 worldwide

ENCORE

MANAGEMENT BRIEFS

Ford begins outsourcing

Ford Motor Co. has begun outsourcing processing at a new data center in Birmingham, Mich., constructed and operated by Unisys Corp. The data center opened last month and will provide remote processing support to several Ford divisions representing 4,500 users in six countries, including an IBM Systems Network Architecture link to Ford headquarters in Dearborn, Mich. The data center will support future Unisys outsourcing customers as well as Ford. Processors include Unisys A16 and A15 mainframes and a dual-processor 2200/423 system.

United Way of America has received a grant from IBM for \$1.5 million worth of Personal System/2 hardware and software to be used in United Way facilities and volunteer centers nationwide. The program, called Involving More People Through Automation and Computer Technology (IMPACT), was piloted by United Way of Metropolitan Atlanta and funded through an earlier \$120,000 IBM grant in December 1989.

Blue Cross

CONTINUED FROM PAGE 89

Network Express communications software. The move enables Blue Cross to ease out of the terminal maintenance business while satisfying the hospitals' preference for using their own hardware and networks.

"When our provider network was installed back in the 1970s, a lot of hospitals had little or no automation. Our terminals might be the only technology they had," Mey says. "But even though we had a lock on providing the equipment, we were not giving as good a level of service as they needed."

The choice of the crash-proof Stratus system had a twofold impact: It saved money over maintaining an extensive IBM terminal network, and it provided greater openness for health care providers and better service for customers.

"The need for immediate verification of claims is there and growing," Mey says. "The health care business is heading for a point-of-sale environment where if your terminals are down, your business is down, too. There is no reason why activity in the health care industry can't follow what is happening in the Visa or Mastercard world."

"We look at things differently now," says Mey, who focuses on research and

wants," says Steven Triangle, a corporate spokesman at Blue Cross. "It has been a very positive reorientation to have the market issues really drive the IS effort."

The mainframes handle four major claims systems for doctors, pharmacies, hospitals and subscribers. The hospital network makes 4,000 requests for data every day, and the number of claims filed daily amount to 25,000, excluding pharmacy claims.

Where there was once relatively little overlap among the different claims groups, there is now such complex intertwining that integrating the claims systems became an obvious necessity.

"We needed a way to tie the components of the health care system together

before we pay a claim," Ward says. "Managed care is all about managing the claims up front. We need to control the cost so we don't overpay and then have to re-group those dollars."

While Blue Cross will continue to offer its traditional Master Health and Master Medical plans, the growth end of the business is expected to be in products "that rely on building networks to the provider community," Triangle says.

One prime example is a "point-of-service" plan that Blue Cross recently sold to AT&T. The plan offers AT&T employees the core benefit of an HMO network of providers but gives them the option of using physicians or hospitals outside that network — for an additional fee, of course.

"This kind of benefit requires the kind of claims systems that can recognize in-network from out-of-network claims and tell the provider what sort of eligibility is there," Triangle says. "We want our systems not only to pay claims as efficiently as possible, but to support this new product portfolio."

By the end of this year, Blue Cross will have integrated the six HMOs it now owns in Massachusetts, making it the state's third largest HMO provider behind Harvard Community Health Plan and Bay State Health Care.

"We are expanding into every area of the state," Triangle says. "We will be the only statewide, integrated managed care company, with something to offer for every niche."

Announcing Less Paperwork.



(Before) (After) Introducing The Billing System You Helped Design.

Before developing our new billing system, we talked to our customers.

We listened to everyone who comes in contact with an invoice—Accounts Payable, Human Resources, Purchasing and the using and processing departments.

During the last two years, we combined your input with state-of-the-art technology in optical imaging, laser printing, EDI and EFT to create a new billing system that delivers the features you want most.

● Less paper plus faster checking and matching capability by printing copies of each time card right on the invoice.

- Easy-to-read, high-quality laser printing.
- Easy-to-handle, standard-size bond paper and no staples.

And we've included options that can save you additional time and money:

- Customized reporting to provide data on usage.
- For those who don't want any paper at all, we offer EDI (Electronic Data Interchange) for billing and EFT (Electronic Funds Transfer) for remittance.

The new Kelly® optical imaging laser billing system. Another industry first—only from Kelly.

KELLY Temporary Services

The Kelly Girl® People - The First and The Best®

©1991 Kelly Services, Inc.

development of new technologies at Blue Cross. "Two years ago, we would have replicated everything with IBM terminals."

IBM is still the vendor of choice for the insurer, however.

During the 1980s, Blue Cross began moving off old Honeywell, Inc. systems onto IBM platforms. Today, the main data center uses a 3090 Model 900S for claims processing, a 3090 Model 170S for Medicare claims and a soon-to-be-replaced Bull HN Information Systems, Inc. DPS 90. The IS division, with about 250 employees, also manages a handful of minicomputers from several vendors and up to 30 local-area networks of personal computers.

When it comes to its computer systems, Blue Cross has held its share of criticism in recent years. In 1990, the commonwealth of Massachusetts released an audit faulting the insurer for a lack of strategic business planning in a \$200 million overhaul of its information systems.

Today, the computer systems upgrade is forging ahead with the implementation of the integrated claims system, which Blue Cross officials say they expect to be completed by mid-1992. The next big project will be an overhaul of the enrollment and billing systems.

"Having the one claims system is important, but what is key is having the IS functionality to provide what the market



Borland's Paradox. Grasp the power of the new standard

Paradox® is now the recognized standard against which all other databases are measured. A database that is as

powerful as it is easy to use.

That's why Paradox has won virtually every database award since its introduction. Including Best Programmable Database for both single-user and multiuser environments (*InfoWorld*, November 1990), the #1 SQL Front End (*NSTL*, February

1991) and Editors' Choice (*PC Magazine*, May 1991). Now you can grasp all of the power that Paradox offers.

Power Without Pain

Paradox's legendary combination of power and ease-of-use has made it the standard for applications developers and users alike. Paradox comes with a full-blown development language, PAL™, for building custom database applications. Plus features such as Query By Example,

multi-table forms and reports, and presentation-quality graphics that make Paradox the #1 choice of database users.

Extend Your Reach!

Paradox Engine and Paradox SQL Link

Paradox® Engine provides C, C++ and Pascal programmers with an Application Programming Interface (API), so your programs can access Paradox data in both single-user and multiuser environments. And with Paradox® SQL Link users can access remote data stored in SQL servers.*

dBASE! Owners!

Grasp Paradox RISK FREE for only \$175

If you own any version of dBASE®, you can upgrade to Paradox 3.5 for only \$175. That's a substantial savings off of the \$795 list price. And you get a 60-day, money-back guarantee. Risk Free. Paradox even reads and writes dBASE files for integration into your existing environment. Order today. See your dealer or call now at 1-800-331-0877.



B O R L A N D
Software Craftsmanship

CODE 1078

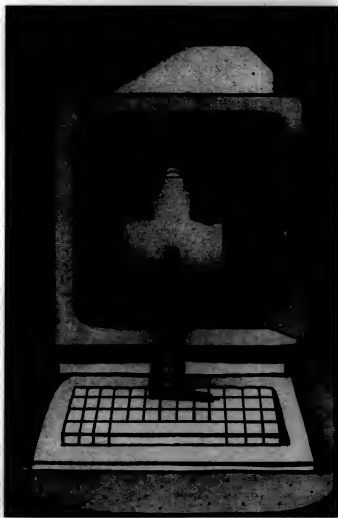
*Requires dBASE 3.04 or later. Oracle and dBase 4.0 servers supported only. Paradox 3.5L (Linx) (\$495 list price, sold separately) and Paradox 3.5 are required to make the connection with SQL servers. Paradox Engine is sold separately. *Offer also valid for owners of dBase 2.0, dBase 3.0, dBase 3.1, dBase 3.2, dBase 3.5, dBase 3.6, dBase 3.7, dBase 3.8, dBase 3.9, dBase 4.0, dBase 4.1, dBase 4.2, dBase 4.3, dBase 4.4, dBase 4.5, dBase 4.6, dBase 4.7, dBase 4.8, dBase 4.9, dBase 5.0, dBase 5.1, dBase 5.2, dBase 5.3, dBase 5.4, dBase 5.5, dBase 5.6, dBase 5.7, dBase 5.8, dBase 5.9, dBase 6.0, dBase 6.1, dBase 6.2, dBase 6.3, dBase 6.4, dBase 6.5, dBase 6.6, dBase 6.7, dBase 6.8, dBase 6.9, dBase 7.0, dBase 7.1, dBase 7.2, dBase 7.3, dBase 7.4, dBase 7.5, dBase 7.6, dBase 7.7, dBase 7.8, dBase 7.9, dBase 8.0, dBase 8.1, dBase 8.2, dBase 8.3, dBase 8.4, dBase 8.5, dBase 8.6, dBase 8.7, dBase 8.8, dBase 8.9, dBase 9.0, dBase 9.1, dBase 9.2, dBase 9.3, dBase 9.4, dBase 9.5, dBase 9.6, dBase 9.7, dBase 9.8, dBase 9.9, dBase 10.0, dBase 10.1, dBase 10.2, dBase 10.3, dBase 10.4, dBase 10.5, dBase 10.6, dBase 10.7, dBase 10.8, dBase 10.9, dBase 11.0, dBase 11.1, dBase 11.2, dBase 11.3, dBase 11.4, dBase 11.5, dBase 11.6, dBase 11.7, dBase 11.8, dBase 11.9, dBase 12.0, dBase 12.1, dBase 12.2, dBase 12.3, dBase 12.4, dBase 12.5, dBase 12.6, dBase 12.7, dBase 12.8, dBase 12.9, dBase 13.0, dBase 13.1, dBase 13.2, dBase 13.3, dBase 13.4, dBase 13.5, dBase 13.6, dBase 13.7, dBase 13.8, dBase 13.9, dBase 14.0, dBase 14.1, dBase 14.2, dBase 14.3, dBase 14.4, dBase 14.5, dBase 14.6, dBase 14.7, dBase 14.8, dBase 14.9, dBase 15.0, dBase 15.1, dBase 15.2, dBase 15.3, dBase 15.4, dBase 15.5, dBase 15.6, dBase 15.7, dBase 15.8, dBase 15.9, dBase 16.0, dBase 16.1, dBase 16.2, dBase 16.3, dBase 16.4, dBase 16.5, dBase 16.6, dBase 16.7, dBase 16.8, dBase 16.9, dBase 17.0, dBase 17.1, dBase 17.2, dBase 17.3, dBase 17.4, dBase 17.5, dBase 17.6, dBase 17.7, dBase 17.8, dBase 17.9, dBase 18.0, dBase 18.1, dBase 18.2, dBase 18.3, dBase 18.4, dBase 18.5, dBase 18.6, dBase 18.7, dBase 18.8, dBase 18.9, dBase 19.0, dBase 19.1, dBase 19.2, dBase 19.3, dBase 19.4, dBase 19.5, dBase 19.6, dBase 19.7, dBase 19.8, dBase 19.9, dBase 20.0, dBase 20.1, dBase 20.2, dBase 20.3, dBase 20.4, dBase 20.5, dBase 20.6, dBase 20.7, dBase 20.8, dBase 20.9, dBase 21.0, dBase 21.1, dBase 21.2, dBase 21.3, dBase 21.4, dBase 21.5, dBase 21.6, dBase 21.7, dBase 21.8, dBase 21.9, dBase 22.0, dBase 22.1, dBase 22.2, dBase 22.3, dBase 22.4, dBase 22.5, dBase 22.6, dBase 22.7, dBase 22.8, dBase 22.9, dBase 23.0, dBase 23.1, dBase 23.2, dBase 23.3, dBase 23.4, dBase 23.5, dBase 23.6, dBase 23.7, dBase 23.8, dBase 23.9, dBase 24.0, dBase 24.1, dBase 24.2, dBase 24.3, dBase 24.4, dBase 24.5, dBase 24.6, dBase 24.7, dBase 24.8, dBase 24.9, dBase 25.0, dBase 25.1, dBase 25.2, dBase 25.3, dBase 25.4, dBase 25.5, dBase 25.6, dBase 25.7, dBase 25.8, dBase 25.9, dBase 26.0, dBase 26.1, dBase 26.2, dBase 26.3, dBase 26.4, dBase 26.5, dBase 26.6, dBase 26.7, dBase 26.8, dBase 26.9, dBase 27.0, dBase 27.1, dBase 27.2, dBase 27.3, dBase 27.4, dBase 27.5, dBase 27.6, dBase 27.7, dBase 27.8, dBase 27.9, dBase 28.0, dBase 28.1, dBase 28.2, dBase 28.3, dBase 28.4, dBase 28.5, dBase 28.6, dBase 28.7, dBase 28.8, dBase 28.9, dBase 29.0, dBase 29.1, dBase 29.2, dBase 29.3, dBase 29.4, dBase 29.5, dBase 29.6, dBase 29.7, dBase 29.8, dBase 29.9, dBase 30.0, dBase 30.1, dBase 30.2, dBase 30.3, dBase 30.4, dBase 30.5, dBase 30.6, dBase 30.7, dBase 30.8, dBase 30.9, dBase 31.0, dBase 31.1, dBase 31.2, dBase 31.3, dBase 31.4, dBase 31.5, dBase 31.6, dBase 31.7, dBase 31.8, dBase 31.9, dBase 32.0, dBase 32.1, dBase 32.2, dBase 32.3, dBase 32.4, dBase 32.5, dBase 32.6, dBase 32.7, dBase 32.8, dBase 32.9, dBase 33.0, dBase 33.1, dBase 33.2, dBase 33.3, dBase 33.4, dBase 33.5, dBase 33.6, dBase 33.7, dBase 33.8, dBase 33.9, dBase 34.0, dBase 34.1, dBase 34.2, dBase 34.3, dBase 34.4, dBase 34.5, dBase 34.6, dBase 34.7, dBase 34.8, dBase 34.9, dBase 35.0, dBase 35.1, dBase 35.2, dBase 35.3, dBase 35.4, dBase 35.5, dBase 35.6, dBase 35.7, dBase 35.8, dBase 35.9, dBase 36.0, dBase 36.1, dBase 36.2, dBase 36.3, dBase 36.4, dBase 36.5, dBase 36.6, dBase 36.7, dBase 36.8, dBase 36.9, dBase 37.0, dBase 37.1, dBase 37.2, dBase 37.3, dBase 37.4, dBase 37.5, dBase 37.6, dBase 37.7, dBase 37.8, dBase 37.9, dBase 38.0, dBase 38.1, dBase 38.2, dBase 38.3, dBase 38.4, dBase 38.5, dBase 38.6, dBase 38.7, dBase 38.8, dBase 38.9, dBase 39.0, dBase 39.1, dBase 39.2, dBase 39.3, dBase 39.4, dBase 39.5, dBase 39.6, dBase 39.7, dBase 39.8, dBase 39.9, dBase 40.0, dBase 40.1, dBase 40.2, dBase 40.3, dBase 40.4, dBase 40.5, dBase 40.6, dBase 40.7, dBase 40.8, dBase 40.9, dBase 41.0, dBase 41.1, dBase 41.2, dBase 41.3, dBase 41.4, dBase 41.5, dBase 41.6, dBase 41.7, dBase 41.8, dBase 41.9, dBase 42.0, dBase 42.1, dBase 42.2, dBase 42.3, dBase 42.4, dBase 42.5, dBase 42.6, dBase 42.7, dBase 42.8, dBase 42.9, dBase 43.0, dBase 43.1, dBase 43.2, dBase 43.3, dBase 43.4, dBase 43.5, dBase 43.6, dBase 43.7, dBase 43.8, dBase 43.9, dBase 44.0, dBase 44.1, dBase 44.2, dBase 44.3, dBase 44.4, dBase 44.5, dBase 44.6, dBase 44.7, dBase 44.8, dBase 44.9, dBase 45.0, dBase 45.1, dBase 45.2, dBase 45.3, dBase 45.4, dBase 45.5, dBase 45.6, dBase 45.7, dBase 45.8, dBase 45.9, dBase 46.0, dBase 46.1, dBase 46.2, dBase 46.3, dBase 46.4, dBase 46.5, dBase 46.6, dBase 46.7, dBase 46.8, dBase 46.9, dBase 47.0, dBase 47.1, dBase 47.2, dBase 47.3, dBase 47.4, dBase 47.5, dBase 47.6, dBase 47.7, dBase 47.8, dBase 47.9, dBase 48.0, dBase 48.1, dBase 48.2, dBase 48.3, dBase 48.4, dBase 48.5, dBase 48.6, dBase 48.7, dBase 48.8, dBase 48.9, dBase 49.0, dBase 49.1, dBase 49.2, dBase 49.3, dBase 49.4, dBase 49.5, dBase 49.6, dBase 49.7, dBase 49.8, dBase 49.9, dBase 50.0, dBase 50.1, dBase 50.2, dBase 50.3, dBase 50.4, dBase 50.5, dBase 50.6, dBase 50.7, dBase 50.8, dBase 50.9, dBase 51.0, dBase 51.1, dBase 51.2, dBase 51.3, dBase 51.4, dBase 51.5, dBase 51.6, dBase 51.7, dBase 51.8, dBase 51.9, dBase 52.0, dBase 52.1, dBase 52.2, dBase 52.3, dBase 52.4, dBase 52.5, dBase 52.6, dBase 52.7, dBase 52.8, dBase 52.9, dBase 53.0, dBase 53.1, dBase 53.2, dBase 53.3, dBase 53.4, dBase 53.5, dBase 53.6, dBase 53.7, dBase 53.8, dBase 53.9, dBase 54.0, dBase 54.1, dBase 54.2, dBase 54.3, dBase 54.4, dBase 54.5, dBase 54.6, dBase 54.7, dBase 54.8, dBase 54.9, dBase 55.0, dBase 55.1, dBase 55.2, dBase 55.3, dBase 55.4, dBase 55.5, dBase 55.6, dBase 55.7, dBase 55.8, dBase 55.9, dBase 56.0, dBase 56.1, dBase 56.2, dBase 56.3, dBase 56.4, dBase 56.5, dBase 56.6, dBase 56.7, dBase 56.8, dBase 56.9, dBase 57.0, dBase 57.1, dBase 57.2, dBase 57.3, dBase 57.4, dBase 57.5, dBase 57.6, dBase 57.7, dBase 57.8, dBase 57.9, dBase 58.0, dBase 58.1, dBase 58.2, dBase 58.3, dBase 58.4, dBase 58.5, dBase 58.6, dBase 58.7, dBase 58.8, dBase 58.9, dBase 59.0, dBase 59.1, dBase 59.2, dBase 59.3, dBase 59.4, dBase 59.5, dBase 59.6, dBase 59.7, dBase 59.8, dBase 59.9, dBase 60.0, dBase 60.1, dBase 60.2, dBase 60.3, dBase 60.4, dBase 60.5, dBase 60.6, dBase 60.7, dBase 60.8, dBase 60.9, dBase 61.0, dBase 61.1, dBase 61.2, dBase 61.3, dBase 61.4, dBase 61.5, dBase 61.6, dBase 61.7, dBase 61.8, dBase 61.9, dBase 62.0, dBase 62.1, dBase 62.2, dBase 62.3, dBase 62.4, dBase 62.5, dBase 62.6, dBase 62.7, dBase 62.8, dBase 62.9, dBase 63.0, dBase 63.1, dBase 63.2, dBase 63.3, dBase 63.4, dBase 63.5, dBase 63.6, dBase 63.7, dBase 63.8, dBase 63.9, dBase 64.0, dBase 64.1, dBase 64.2, dBase 64.3, dBase 64.4, dBase 64.5, dBase 64.6, dBase 64.7, dBase 64.8, dBase 64.9, dBase 65.0, dBase 65.1, dBase 65.2, dBase 65.3, dBase 65.4, dBase 65.5, dBase 65.6, dBase 65.7, dBase 65.8, dBase 65.9, dBase 66.0, dBase 66.1, dBase 66.2, dBase 66.3, dBase 66.4, dBase 66.5, dBase 66.6, dBase 66.7, dBase 66.8, dBase 66.9, dBase 67.0, dBase 67.1, dBase 67.2, dBase 67.3, dBase 67.4, dBase 67.5, dBase 67.6, dBase 67.7, dBase 67.8, dBase 67.9, dBase 68.0, dBase 68.1, dBase 68.2, dBase 68.3, dBase 68.4, dBase 68.5, dBase 68.6, dBase 68.7, dBase 68.8, dBase 68.9, dBase 69.0, dBase 69.1, dBase 69.2, dBase 69.3, dBase 69.4, dBase 69.5, dBase 69.6, dBase 69.7, dBase 69.8, dBase 69.9, dBase 70.0, dBase 70.1, dBase 70.2, dBase 70.3, dBase 70.4, dBase 70.5, dBase 70.6, dBase 70.7, dBase 70.8, dBase 70.9, dBase 71.0, dBase 71.1, dBase 71.2, dBase 71.3, dBase 71.4, dBase 71.5, dBase 71.6, dBase 71.7, dBase 71.8, dBase 71.9, dBase 72.0, dBase 72.1, dBase 72.2, dBase 72.3, dBase 72.4, dBase 72.5, dBase 72.6, dBase 72.7, dBase 72.8, dBase 72.9, dBase 73.0, dBase 73.1, dBase 73.2, dBase 73.3, dBase 73.4, dBase 73.5, dBase 73.6, dBase 73.7, dBase 73.8, dBase 73.9, dBase 74.0, dBase 74.1, dBase 74.2, dBase 74.3, dBase 74.4, dBase 74.5, dBase 74.6, dBase 74.7, dBase 74.8, dBase 74.9, dBase 75.0, dBase 75.1, dBase 75.2, dBase 75.3, dBase 75.4, dBase 75.5, dBase 75.6, dBase 75.7, dBase 75.8, dBase 75.9, dBase 76.0, dBase 76.1, dBase 76.2, dBase 76.3, dBase 76.4, dBase 76.5, dBase 76.6, dBase 76.7, dBase 76.8, dBase 76.9, dBase 77.0, dBase 77.1, dBase 77.2, dBase 77.3, dBase 77.4, dBase 77.5, dBase 77.6, dBase 77.7, dBase 77.8, dBase 77.9, dBase 78.0, dBase 78.1, dBase 78.2, dBase 78.3, dBase 78.4, dBase 78.5, dBase 78.6, dBase 78.7, dBase 78.8, dBase 78.9, dBase 79.0, dBase 79.1, dBase 79.2, dBase 79.3, dBase 79.4, dBase 79.5, dBase 79.6, dBase 79.7, dBase 79.8, dBase 79.9, dBase 80.0, dBase 80.1, dBase 80.2, dBase 80.3, dBase 80.4, dBase 80.5, dBase 80.6, dBase 80.7, dBase 80.8, dBase 80.9, dBase 81.0, dBase 81.1, dBase 81.2, dBase 81.3, dBase 81.4, dBase 81.5, dBase 81.6, dBase 81.7, dBase 81.8, dBase 81.9, dBase 82.0, dBase 82.1, dBase 82.2, dBase 82.3, dBase 82.4, dBase 82.5, dBase 82.6, dBase 82.7, dBase 82.8, dBase 82.9, dBase 83.0, dBase 83.1, dBase 83.2, dBase 83.3, dBase 83.4, dBase 83.5, dBase 83.6, dBase 83.7, dBase 83.8, dBase 83.9, dBase 84.0, dBase 84.1, dBase 84.2, dBase 84.3, dBase 84.4, dBase 84.5, dBase 84.6, dBase 84.7, dBase 84.8, dBase 84.9, dBase 85.0, dBase 85.1, dBase 85.2, dBase 85.3, dBase 85.4, dBase 85.5, dBase 85.6, dBase 85.7, dBase 85.8, dBase 85.9, dBase 86.0, dBase 86.1, dBase 86.2, dBase 86.3, dBase 86.4, dBase 86.5, dBase 86.6, dBase 86.7, dBase 86.8, dBase 86.9, dBase 87.0, dBase 87.1, dBase 87.2, dBase 87.3, dBase 87.4, dBase 87.5, dBase 87.6, dBase 87.7, dBase 87.8, dBase 87.9, dBase 88.0, dBase 88.1, dBase 88.2, dBase 88.3, dBase 88.4, dBase 88.5, dBase 88.6, dBase 88.7, dBase 88.8, dBase 88.9, dBase 89.0, dBase 89.1, dBase 89.2, dBase 89.3, dBase 89.4, dBase 89.5, dBase 89.6, dBase 89.7, dBase 89.8, dBase 89.9, dBase 90.0, dBase 90.1, dBase 90.2, dBase 90.3, dBase 90.4, dBase 90.5, dBase 90.6, dBase 90.7, dBase 90.8, dBase 90.9, dBase 91.0, dBase 91.1, dBase 91.2, dBase 91.3, dBase 91.4, dBase 91.5, dBase 91.6, dBase 91.7, dBase 91.8, dBase 91.9, dBase 92.0, dBase 92.1, dBase 92.2, dBase 92.3, dBase 92.4, dBase 92.5, dBase 92.6, dBase 92.7, dBase 92.8, dBase 92.9, dBase 93.0, dBase 93.1, dBase 93.2, dBase 93.3, dBase 93.4, dBase 93.5, dBase 93.6, dBase 93.7, dBase 93.8, dBase 93.9, dBase 94.0, dBase 94.1, dBase 94.2, dBase 94.3, dBase 94.4, dBase 94.5, dBase 94.6, dBase 94.7, dBase 94.8, dBase 94.9, dBase 95.0, dBase 95.1, dBase 95.2, dBase 95.3, dBase 95.4, dBase 95.5, dBase 95.6, dBase 95.7, dBase 95.8, dBase 95.9, dBase 96.0, dBase 96.1, dBase 96.2, dBase 96.3, dBase 96.4, dBase 96.5, dBase 96.6, dBase 96.7, dBase 96.8, dBase 96.9, dBase 97.0, dBase 97.1, dBase 97.2, dBase 97.3, dBase 97.4, dBase 97.5, dBase 97.6, dBase 97.7, dBase 97.8, dBase 97.9, dBase 98.0, dBase 98.1, dBase 98.2, dBase 98.3, dBase 98.4, dBase 98.5, dBase 98.6, dBase 98.7, dBase 98.8, dBase 98.9, dBase 99.0, dBase 99.1, dBase 99.2, dBase 99.3, dBase 99.4, dBase 99.5, dBase 99.6, dBase 99.7, dBase 99.8, dBase 99.9, dBase 100.0, dBase 100.1, dBase 100.2, dBase 100.3, dBase 100.4, dBase 100.5, dBase 100.6, dBase 100.7, dBase 100.8, dBase 100.9, dBase 101.0, dBase 101.1, dBase 101.2, dBase 101.3, dBase 101.4, dBase 101.5, dBase 101.6, dBase 101.7, dBase 101.8, dBase 101.9, dBase 102.0, dBase 102.1, dBase 102.2, dBase 102.3, dBase 102.4, dBase 102.5, dBase 102.6, dBase 102.7, dBase 102.8, dBase 102.9, dBase 103.0, dBase 103.1, dBase 103.2, dBase 103.3, dBase 103.4, dBase 103.5, dBase 103.6, dBase 103.7, dBase 103.8, dBase 103.9, dBase 104.0, dBase 104.1, dBase 104.2, dBase 104.3, dBase 104.4, dBase 104.5, dBase 104.6, dBase 104.7, dBase 104.8, dBase 104.9, dBase 105.0, dBase 105.1, dBase 105.2, dBase 105.3, dBase 105.4, dBase 105.5, dBase 105.6, dBase 105.7, dBase 105.8, dBase 105.9, dBase 106.0, dBase 106.1, dBase 106.2, dBase 106.3, dBase 106.4, dBase 106.5, dBase 106.6, dBase 106.7, dBase 106.8, dBase 106.9, dBase 107.0, dBase 107.1, dBase 107.2, dBase 107.3, dBase 107.4, dBase 107.5, dBase 107.6, dBase 107.7, dBase 107.8, dBase 107.9, dBase 108.0, dBase 108.1, dBase 108.2, dBase 108.3, dBase 108.4, dBase 108.5, dBase 108.6, dBase 108.7, dBase 108.8, dBase 108.9, dBase 109.0, dBase 109.1, dBase 109.2, dBase 109.3, dBase 109.4, dBase 109.5, dBase 109.6, dBase 109.7, dBase 109.8, dBase 109.9, dBase 110.0, dBase 110.1, dBase 110.2, dBase 110.3, dBase 110.4, dBase 110.5, dBase 110.6, dBase 110.7, dBase 110.8, dBase 110.9, dBase 111.0, dBase 111.1, dBase 111.2, dBase 111.3, dBase 111.4, dBase 111.5, dBase 111.6, dBase 111.7, dBase 111.8, dBase 111.9, dBase 112.0, dBase 112.1, dBase 112.2, dBase 112.3, dBase 112.4, dBase 112.5, dBase 112.6, dBase 112.7, dBase 112.8, dBase 112.9, dBase 113.0, dBase 113.1, dBase 113.2, dBase 113.3, dBase 113.4, dBase 113.5, dBase 113.6, dBase 113.7, dBase 113.8, dBase 113.9, dBase 114.0, dBase 114.1, dBase 114.2, dBase 114.3, dBase 114.4, dBase 114.5, dBase 114.6, dBase 114.7, dBase 114.8, dBase 114.9, dBase 115.0, dBase 115.1, dBase 115.2, dBase 115.3, dBase 115.4, dBase 115.5, dBase 115.6, dBase 115.7, dBase 115.8, dBase 115.9, dBase 116.0, dBase 116.1, dBase 116.2, dBase 116.3, dBase 116.4, dBase 116.5, dBase 116.6, dBase 116.7, dBase 116.8, dBase 116.9, dBase 117.0, dBase 117.1, dBase 117.2, dBase 117.3, dBase 117.4, dBase 117.5, dBase 117.6, dBase 117.7, dBase 117.8, dBase 117.9, dBase 118.0, dBase 118.1, dBase 118.2, dBase 118.3, dBase 118.4, dBase 118.5, dBase 118.6, dBase 118.7, dBase 118.8, dBase 118.9, dBase 119.0, dBase 119.1, dBase 119.2, dBase 119.3, dBase 119.4, dBase 119.5, dBase 119.6, dBase 119.7, dBase 119.8, dBase 119.9, dBase 120.0, dBase 120.1, dBase 120.2, dBase 120.3, dBase 120.4, dBase 120.5, dBase 120.6, dBase 120.7, dBase 120.8, dBase 120.9, dBase 121.0, dBase 121.1, dBase 121.2, dBase 121.3, dBase 121.4, dBase 121.5, dBase 121.6, dBase 121.7, dBase 121.8, dBase 121.9, dBase 122.0, dBase 122.1, dBase 122.2, dBase 122.3, dBase 122.4, dBase 122.5, dBase 122.6, dBase 122.7, dBase 122.8, dBase 122.9, dBase 123.0, dBase 123.1, dBase 123.2, dBase 123.3, dBase 123.4, dBase 123.5, dBase 123.6, dBase 123.7, dBase 123.8, dBase 123.9, dBase 124.0, dBase 124.1, dBase 124.2, dBase 124.3, dBase 124.4, dBase 124.5, dBase 124.6, dBase 124.7, dBase 124.8, dBase 124.9, dBase 125.0, dBase 125.1, dBase 125.2, dBase 125.3, dBase 125.4, dBase 125.5, dBase 125.6, dBase 125.7, dBase 125.8, dBase 125.9, dBase 126.0, dBase 126.1, dBase 126.2, dBase 126.3, dBase 126.4, dBase 126.5, dBase 126.6, dBase 126.7, dBase 126.8, dBase 126.9, dBase 127.0, dBase 127.1, dBase 127.2, dBase 127.3, dBase 127.4, dBase 127.5, dBase 127.6, dBase 127.7, dBase 127.8, dBase 127.9, dBase 128.0, dBase 128.1, dBase 128.2, dBase 128.3, dBase 128.4, dBase 128.5, dBase 128.6, dBase 128.7, dBase 128.8, dBase 128.9, dBase 129.0, dBase 129.1, dBase 129.2, dBase 129.3, dBase 129.4, dBase 129.5, dBase 129.6, dBase 129.7, dBase 129.8, dBase 129.9, dBase 130.0, dBase 130.1, dBase 130.2, dBase 130.3, dBase 130.4, dBase 130.5, dBase 130.6, dBase 130.7, dBase 130.8, dBase 130.9, dBase 131.0, dBase 131.1, dBase 131.2, dBase 131.3, dBase 131.4, dBase 131.5, dBase 131.6, dBase 131.7, dBase 131.8, dBase 131.9, dBase 132.0, dBase 132.1, dBase 132.2, dBase 132.3, dBase 132.4, dBase 132.5, dBase 132.6, dBase 132.7, dBase 132.8, dBase 132.9, dBase 133.0, dBase 133.1, dBase 133.2, dBase 133.3, dBase 133.4, dBase 133.5, dBase 133.6, dBase 133.7, dBase 133.8, dBase 133.9, dBase 134.0, dBase 134.1, dBase 134.2, dBase 134.3, dBase 134.4, dBase 134.5, dBase 134.6, dBase 134.7, dBase 134.8, dBase 134.9, dBase 135.0, dBase 135.1, dBase 135.2, dBase 135.3, dBase 135.4, dBase 135.5, dBase 135.6, dBase 135.7, dBase 135.8, dBase 135.9, dBase 136.0, dBase 136.1, dBase 136.2, dBase 136.3, dBase 136.4, dBase 136.5, dBase 136.6, dBase 136.7, dBase 136.8, dBase 136.9, dBase 137.0, dBase 137.1, dBase 137.2, dBase 137.3, dBase 137.4, dBase 137.5, dBase 137.6, dBase 137.7, dBase 137.8, dBase 137.9, dBase 138.0, dBase 138.1, dBase 138.2, dBase 138.3, dBase 138.4, dBase 138.5, dBase 138.6, dBase 138.7, dBase 138.8, dBase 138.9, dBase 139.0, dBase 139.1, dBase 139.2

SPECIAL REPORT

ADVANCES ON THE PC FRONT

Opening the way for new uses

*Gutsier hardware, more capable software, improved communications...
Is it any wonder companies are starting to rethink the role of PCs?*



David L. Latham



*Key developments and how they
are being put to use.*
PAGES 96, 97

*Products that are helping end users
help themselves.*
PAGE 98

Boosters for older systems.
PAGE 99

Helping PCs mix with other platforms.
PAGE 99

*Unix on PCs:
Why it's starting to make sense.*
PAGE 100

Clone makers focus on innovation.
PAGE 101

Make a wish: it's your market now.
PAGE 101

*Dollars may be in short supply,
but they go further.*
PAGE 104

*What GUIs have wrought:
A host of input options.*
PAGE 106

Short-term directions.
PAGE 108

Long-term expectations.
PAGE 110

*Douglas Engelbart on how PCs
fit into the big picture.*
PAGE 111

Beyond the beginners' slope

Recent developments have convinced many corporate users that personal computers can handle more advanced and business-critical assignments

BY RICHARD PASTORE

Technology breakthroughs and evolutionary enhancements may be fewer and farther between in some segments of the computer industry. But in the personal computer environment, developments in hardware and peripherals, operating systems, software applications, communications and

connectivity continue to open doors for new kinds of PC uses and users.

In PC hardware, increased power in tinier packages has finally made it practical for users who require portability and high functionality to make do with just one computer (see story next page).

This long-anticipated breakthrough came late last year with the arrival of the first notebook-size PCs with high-powered processors, random access memory and large storage capacities. Expansion chassis made by Compaq Computer Corp., Tandem Corp. and others provide extra storage, hard disk drives and slots, augmenting the portables' built-in capabilities.

Additional power and functionality have also appeared in larger PC systems, making it possible for PC network servers to do the work of minicomputers or even mainframes.

"A year or two ago, you couldn't bring down a 100-byte database" from a larger to a smaller system, says Frank Michoof, an analyst at Meta Group, Inc. in Westport, Conn. Now, "supercomputers" — with as much as 20G bytes of disk storage and eight microprocessors — allow users to develop and run major mainframe-scale applications speedily and



cheaply on the PC local-area network. Multiprocessor systems of this type are available from Compaq, Netframe Systems, Inc., Advanced Logic Research, Inc. and a number of other vendors.

For some users, the ability to develop and run applications on PCs makes all the difference. "We'd been thinking of doing decision-support applications on the mainframe, but the cost was prohibitive," says Stephen

Anderson, an information systems architect for the state of Washington's Department of Social and Health Services. Now, a Netframe PC supercomputer is saving the department thousands of dollars in mainframe costs.

The main developments in PC peripherals have been price reductions achieved through component redesigns and manufacturing processes.

Laser printer prices have dropped about 22% in the last two years, according to BIS Strategic Decisions in Norwell, Mass. And recently, prices of desktop scanners have also moved down, making document image processing affordable for more organizations.

In the operating systems area, changes have been cosmetic but hardly superficial. Graphical user interfaces — most notably, Microsoft Corp.'s Windows 3.0, introduced last year — have simplified PC interaction and brought microcomputer technology to a new class of users.

Network operating systems have also matured significantly. Some now provide enhanced security features and node capacities that allow networks to accommodate more users and higher level applications (see story next page).

One of the most interesting new developments in the software applications arena is work-flow management software. New packages such as Lotus Development Corp.'s Notes and AT&T's Rhapsody Business Orchestration Solution automate the many steps involved in an office procedure such as logging and delegating customer complaints. Office workers who once had to pick their way manually through the myriad steps of a

particular task can now be cued by the software (see story next page).

Capabilities such as hyperlinks, active documents and object linking and embedding, which are starting to appear in some PC applications, also free users from the need to perform some manual processes. These capabilities let users build intelligence into their documents so they can, for example, automatically access another document or form for the user to reference.

At Canadian nuclear utility Ontario Hydro, Interleaf, Inc.'s document management software allows staffers filling out on-line government forms to reference a government regulation manual without enjoining the form on which they are working.

In the area of communications and connectivity, arguably no technology has changed the way businesses work with PCs more than electronic mail. Today, a key enhancement making E-mail more functional is the ability to send messages between dissimilar LANs.

"A couple of years ago, you could send mail to somebody in the office next to you on the same LAN, but you couldn't send it upstairs to the next LAN," says Mark Leary, an analyst at International Data Corp. That changed with packages such as Consumers Software, Inc.'s Network Connect and Soft-Switch,

Inc.'s Softswitch Central, which connect LAN users to corporatewide E-mail systems without the need for major in-house bridge building. Increases in transmission rates and throughput speed now also make it possible to send more types of data across E-mail channels — images and even voice, Leary says. There's even some help for the harried with E-mail filters that permit automatic screening and routing of incoming messages.

Client/server connectivity has also become a practical reality as software has been designed to link PCs with mainframe and minicomputer servers in transparent-access modes. PC users can now grab data from host systems without moving to a dumb terminal or bothering with mainframe access and query languages. This has enabled more computer novices to interact with on-line data and has increased the speed with which data on multiple hosts can be downloaded to a PC (see story next page).

Electronic data interchange (EDI) has really settled in on the PC. Today, users working with PC-based financial tools can pull EDI data from suppliers or customers off their PC networks, instead of having to download it from the mainframe.

Even the up-front savings is substantial: Mainframe EDI systems can cost hundreds of thousands of dollars; PC-based packages cost thousands. ■



Robert G. Mitchell

Pastore is a Computerworld staff writer.

Lightweight KOs desktop unit

Alice Goldberg threw away her checklists this March when she acquired a single personal computer for office, home and on-the-road work.

Goldberg, a senior consultant at pharmaceutical firm Ciba-Geigy Corp. in Ardsley, N.Y., had been searching for an all-purpose computer for some time, but something always seemed to be missing. Machines that were powerful enough and offered enough storage capacity to support front-end processing for an IBM 3090 mainframe as well as typical word processing and spreadsheet duties weighed considerably more than what Goldberg was willing to lug around. And the lightweights she looked at were just that when it

came to power.

Instead, she made do with two computers—in IBM Personal System/2 Model 80 for the office and Compaq Computer Corp. LTE 286 for everywhere else—and lots of time-consuming file transfers.

What liberated Goldberg from this backup and update drudgery was the Compaq LTE 386S/20. Introduced last October, the machine was the first of what is now a small band of full-function notebook PCs capable of handling desktop computing chores. Compaq's expansion chassis, which houses the LTE when it is operating in office mode, contains two expansion slots and room for two 80MB or 120MB-byte hard disk drives, floppy

disk drives or tape drives.

"I don't think I could have used it as my sole machine without that expandability," she says. The PS/2 she gave up contained a 190M-byte hard disk.

Also crucial is the fact that the expansion chassis hooks directly into the firm's network and its IBM 3090. The improvements have a price, though. The notebook, chassis and full-size keyboard and color monitor cost \$15,000, compared with about \$10,000 for the PS/2 and LTE 286 combo she used before.

Only time and use will show whether the extra expense is worth it, Goldberg says. If she takes the machine outside the office three times a week, she figures she will get her money's worth. So far, the 386S/20 has been making that quota.



Goldberg: a one computer woman

Software to do the grunt work

Personal computer-based work-flow management will become a reality this month at TRW, Inc.'s Electronic Systems Group when the company's procurement department turns over management of a tedious, lengthy purchase order process to AT&T's Rhaphody Business Orchestration Solution with the goal of shaving roughly 50% off lead time.

When a government requisition for satellite or spacecraft electronics comes into the Redondo Beach, Calif., contractor, up to 116 procedural steps are required to convert it into a purchase order—a process that takes from 96 to 116 days.

In the past, TRW buyers manually

compiled purchase order notebooks filled with up to 98 sections. The "notebooks" will now be compiled electronically using Rhaphody software residing on 80 networked AT&T PCs and servers.

The software takes control by determining in advance which forms are required for a project requisition, then walking the buyer through each procedure, says Fred C. Leland Jr., the group's procurement manager.

The PCs, linked to two AT&T Starlan servers and TRW's various hosts via Ethernet, also eliminate the need for buyers to chase down data on dispersed, stand-alone systems. The Electronic Systems Group

tried to implement a similar system three years ago but found the mainframe/PC-based solutions too expensive and limited because they didn't offer transparent, single sharing of common data such as purchase order templates. The turnkey Rhaphody system, which began shipping in October 1990, met more of the firm's requirements than systems from any of the 23 other vendors considered, Leland says.

Rhaphody and similar newly released products have brought workflow management to the PC-level platform for the first time.

Leland says his conservative estimate is that the efficiencies of automated workflow will cut lead time to 50 days. That should free 16 of the 100 buyers for redeployment.

Big picture on small systems

Until last fall, metallurgists and technologists at steel fabricator Armaco Advanced Materials Corp. had to cull research data piece by piece from a variety of hosts dispersed around the company's Butler, Pa., facility. The key to it into their personal computers. That's changing, though, because the company has adopted a client/server architecture that offers transparent host access from Apple Computer, Inc. Macintoshes.

"Now we can look at anything that's going on anywhere in the business," says Thomas Lutz, chief information officer.

For example, a metallurgist investigating a product defect may require data from the plant's hot mill and its melt shop. Before, he would have had to access computers in both areas sequentially from a dumb terminal, using different utility query programs. Now, he simply selects the database he wants from a Macintosh menu, points and clicks. Digital Equipment Corp.'s Pathworks and Fairfield Software, Inc.'s Clear Access do the rest. The client/server programs create a utility query program in the background and deliver the data to the Macintosh transparently.

Client/server connectivity has also given many staff members their first opportunity to access VAX-based data. "We've probably doubled or quadrupled the number of users," says Thomas Morrison, information automation manager.

Some of those new users are operating-department engineers and supervisors who do not have much computer background. Now they can access host-based production data to analyze the effects of certain temperatures and galvanizing speeds on steel qualities.

Stories on this page written by Computerworld senior writer Richard Pastore.

Permit to build without big iron

Advances in network operating systems have lifted limitations and brought new levels of functionality to personal computer-based networks, particularly in the area of applications development and the types of applications that can be run on PC networks.

At Rhone-Poulenc Rover, Inc., new functionality in Novell, Inc.'s Netware 386 operating system has turned the firm's PC local-area network into a powerful applications platform.

The Fort Washington, Pa.-based pharmaceutical firm has been networking PCs since 1986. But it is only since last year's adoption of Netware 386 that Rhone has been able to design and implement mainframe-scale applications on the network, saving the relatively higher expenses and longer lead times commonly associated with mainframe development, says Marc Kustoff, director of microcomputing.

The operating system, released by Novell in mid-1989, supports 250 users per server, a key improvement over its predecessor's support limitation of 100 users per server.

The company now has 1,000 PCs on eight networks, all interconnected and running Netware 386.

More importantly, the operating

system provides new facilities that allow Kustoff to better segregate users into specific access categories. This enhances internal security and in turn allows more sensitive data to reside on the network servers.

In the past, sensitive data—and the applications that drew upon it—had to be mainframe-resident to ensure protection from unauthorized user access.

Rhone recently developed a finance application on the PC LAN. Before Netware, according to Kustoff, "we would have had to develop on the [IBM 3090] mainframe because 50 people needed access to it."

Mainframe development would have been less desirable not only because of the extra expense and time but also because the financial data was originally microcomputer-based.

Mainframe development would also have been less popular with users. "Users really wanted a micro-based tool because that's really where the data is coming from," Kustoff says.



Kustoff: Moves development closer to data source

No thanks, I can do it by myself

New tools and utilities are helping to turn passive end users into PC adventurers

BY KATHLEEN A. GOW

Many personal computer users who could barely walk through a software program a few short seasons ago are now starting to build their own applications. Once-computerphobic executives are now scheduling their work, filtering their messages and tapping external databases. This developmental surge is happening largely because

developers of PC software are starting to create products with nontechnical users in mind.

"One of the biggest things enabling users is when software companies sneak a programming language into a product," says Marshall Moseley, a software analyst at Dataquest, Inc. in San Jose, Calif. "There are people who use complex macro languages — in spreadsheets, for instance — who don't know they're programming because it happens in the background."

Forms-based products — some of which act as front ends to databases — also allow users to create reports in a visual mode and without obvious programming. Numerous products of this type have debuted during the past 12 months.

Easy to learn

Don Chase, microcomputer manager for the Washington Department of Wildlife in Olympia, Wash., has been working with Berland International, Inc.'s Objectvision since February, and he says the forms-based programming tool for Microsoft Corp.'s Windows 3.0 graphical user interface environment is something that even the department's computer-averse field biologists can learn to use.

Jim Crain, division chief at the city of Los Angeles' Client Services Department, agrees. "Objectvision — as a simple front end to Paradigm — is a natural first tool," he says. "It's easy to use the decision trees as the logic behind forms, and users graphically construct logic by manipulating icons and connecting them with lines."

Asked by two of its clients to suggest a flexible and easy-to-use database product, Ease of Milwaukee, Inc. (a Novell, Inc. value-added reseller, picked Ventura Software, Inc.'s Formbase. Neither client site had in-house programmers or a particularly high level of computer literacy, says James Jaeger, vice president of sales at Computer Ease, but the firms' orientation, the point-and-click interface and the good Help screens and sample programs meant

that clients could easily make changes to applications developed by the reseller.

"They didn't want to have to hire a programmer for every little change," Jaeger says.

Apple Computer, Inc.'s Hypercard and similar products also "reduce the entry-level barriers for users," says Rich Bader, a contributing editor to Stewart Alap's PC Letter, because they use the metaphor of the card, with information organized like stacks of cards.

Although often slow and difficult to learn and use, these products reward persistent users by allowing them to work in nonlinear ways.

Don Cooper, a senior attorney in the environmental law section at Dow Chemical Co. in Midland, Mich., is using Hypercard from Brightbill Roberts to develop an environmental law program that will serve as both a training tool for lawyers and engineers and a reference tool for on-site inspections.

Hypercard does require some understanding of programming con-

Products in this amorphous category are designed to empower users by linking them to the expertise of other users and to multiple sources of data.

Lotus Development Corp.'s Notes, introduced in December 1989, helped to popularize the emerging — and as yet largely undefined — groupware category, according to Dan Nees, a microcomputer industry analyst at La Jolla, Calif.-based Computer Intelligence.

Brad Jackson, a project leader in the information technology department at Texaco, Inc., says Notes allows users with little technical background to easily create interactive discussion databases and even attach scanned-in images to files.

Notes 2.0, unveiled in February, added support for applications integration with Dynamic Data Exchange and Object Linking and Embedding.

David Marinhak, a senior consultant at Patricia Seybold's Office Computing Group in Boston, says that in terms of difficulty, Notes occupies roughly the same level as databases with simplified front ends and products such as Lightship from Cambridge, Mass.-based Plot Executive Software or Q+E from Raleigh, N.C.-based Pioneer Software Systems, Inc.

Lightship is an executive information system-building tool designed specifically for nonprogrammers. Q+E is a package that allows users to query and edit database-compatible databases and to access external ones from Microsoft's Excel spreadsheet.

According to Marinhak, all of these products provide enough in the way of programming models, or templates, that users can manage to build simple applications on their own, but they require a sophisticated user or a systems professional to build strategic, robust applications.

Control benefits

A different kind of software that is giving users more control over information and their own time is work-flow automation software. A specific category of software carries this title and actually allows users to automate routine parts of work procedures (see story page 86). There are also a number of other products that assist work flow by filtering, prioritizing and managing information.

Beyondmail from Cambridge, Mass.-based Beyond, Inc. handles those sorts of chores for electronic mail users.

Previewed at Network in February and expected to ship sometime this summer, the expanded E-mail application can do such things as analyze the contents of an incoming E-mail message and, for example, retype it

to a manager's secretary because it came from accounting and contains the word *revenue* in a header field or in the body text.

Another critical measure of freedom comes from the ability to use on-line, context-sensitive Help facilities to maneuver through access procedures and new applications created elsewhere.

Analysts agree that on-line Help desks have become a necessity, with context-sensitive Help and the ability



Cooper built an environmental law program with Hypercard

to search on key words and phrases seen as the dividing features between good and simply fair Help programs.

Seybold's Marinhak sees Help desks of the future moving to just-in-time training and learning, where, for instance, if a user is having trouble doing a mail merge, the application will sense the problem and present a video or animated instruction program. The Help facilities available today are not quite that intuitive. A user seeking help usually has to click on an icon to pull up a screen of clarifying Help text.

New categories of Help tools are emerging all the time.

Bader says Hewlett-Packard Co.'s New Wave, which runs on top of Windows, is an example of an emerging genre. "It has the ability to routinize or proceduralize steps on a machine," he says. It also allows the cooperation of multiple applications packages with capabilities defined in terms of users. Users have to understand some basic concepts of programming to use New Wave. Bader says, but they don't need a programming background.

There is clearly still some distance to be covered in this field. A number of products aimed at increasing end-user independence are still too complicated for many users.

But analysts say that within a software generation or two, a significant number of products will provide truly intuitive operations for end users. In the meantime, there's enough around for the more adventurous to start testing their wings. ■



Cooper plans to let Department of Wildlife scientists handle their own forms creation

cepts, Cooper says. "It's not for novices" (Version 2.0 of Hypercard, due to ship early this month, may lower the threshold somewhat). The prepared tools and idea pads allow selection of buttons and ideas to build on. There's a shortcut version to writing scripts, and buttons can be linked to another card.

Groupware arrives

One area seen as having a lot of promise as a user enabler is the category of organizational productivity tools sometimes called "groupware."

Gow is a free-lance writer based in Medford, Mass.

New hope for tired systems

You don't have to settle for sluggish performance if you use old PCs

BY DEREK SLATER

It's possible not only to buy more powerful ready-made engines these days but also to crank the performance of existing machines to new highs using add-in boosters. Name an area of weakness, and there's a fix-it device to get your machine pumping data almost as if it belonged to the next chip generation. Consider these examples:

BLOCKAGE: Hard drive bottlenecks. Booster option 1: Software caches. Traffic jams on the hard drive can slow a personal computer faster than almost anything else. Memory caching software is one fix. Caches reserve an amount of random-access memory on which to record data from the hard drive for quicker access.

Standard utilities packages — such as Cupertino, Calif.-based Symantec Corp.'s Norton Utilities and Beaverton, Ore.-based Central Point Software, Inc.'s PC Tools Deluxe — include disk caching programs. However, today's RAM-hungry applications may leave little extra system memory to set aside.

One product that acknowledges this dilemma is Super PC-Kwik Power

— Slater is *Computerworld's* new products writer.

Pack, an integrated set of system-accelerating software utilities from MultiSoft Corp. in Beaverton, Ore. MultiSoft recently added a function that returns memory from the cache to the system when a big program such as Microsoft Corp.'s Windows 3.0 is running.

Booster option 2: Caching disk controllers. Add-in caching hard disk controllers come with a higher price tag but also offer a higher level of performance; users report that the results can be dramatic.

The Fisher Associates, Inc., a Torrance, Calif.-based risk analysis firm, bought a Hyperstor-1600 from Perceptive Solutions, Inc. in Dallas to cut database access times on an Intel Corp. 80386-based server. Company President Fred Fisher says the company is processing three times as many invoices in one seventh of the time. Caching controllers cost any-

where from \$400 to \$1,800, depending on the amount of memory on the board and the drive compatibilities included. The Hyperstor — which costs about \$1,200 — supports mixed-drive environments. Several vendors are introducing lower-end boards compatible with single drive types.

Booster option 3: Hard drive replacements.

Taking the caching concept a step further, some users choose to eliminate the hard drive entirely and replace it with a RAM board. The memory available on these boards is grid-drain increasing; one of the highest capacity boards available now is the BRC-Ram-48 Ramdisk, a single in-line memory module board from Costa Mesa, Calif.-based Bristol Research Corp. The cost is \$6,995 for the full 48M-byte version of the product, which was introduced in March.

BLOCKAGE: RAM cram. Booster option: Memory management software. For some, memory is as much a sticking point as speed. This is particularly true for users of laptop and notebook comput-

ers, which have little space for extra memory chips or high-capacity hard drives.

One helper is memory management software such as Santa Monica, Calif.-based Quarterdeck Office Systems' QEMM. Memory managers help users alleviate RAM crunch by making better use of existing memory. QEMM controls the 386's virtual 8086 and 32-bit protected modes, transforming the PC's memory into expanded and extended memory.

BLOCKAGE: Storage squeeze. Booster option 1: Removable hard drives. Disk space is another issue. A number of vendors are offering removable

drives, and older versions are being tuned up to keep the pace. In some cases adding support for OS/2, Unix and popular networking software.

Booster option 2: High-density floppies. Higher capacity floppy disks

may eventually become a common augmentation or replacement for hard drives, according to analyst George Thompson at Dataparc Research Corp. in Delran, N.J.

Very High Density Floppy (VHDF) disk systems, with more than 20M bytes of storage space on a 3½-in. disk, are currently manufactured by San Jose, Calif.-based Brite Technology.

VHDF disk systems can be inserted into internode bays or used as stand-alone peripherals. ■

Getting the platforms to mesh

BY JOHN WEBSTER

The ability to support diversity within personal computer local-area networks — and to have multipatform connectivity across them — has become a burning issue as companies strive to share data more effectively across work groups and functions.

Vendors have been responding to these new realities.

"Before, you were forced to build separate network architectures," explains Paul Bandrowski, manager of advanced technology at Sara Lee Corp. in Chicago. Now, he says, it is becoming more feasible to "combine tasks from separate networks into one network, even one data link. The cost is reduced, and it's easier to maintain."

Routers in general have become more adept at moving multiple packet types over Transmis-

sion Control Protocol/Internet Protocol (TCP/IP). Systems Network Architecture and AppleTalk.



Webster is a free-lance writer based in San Francisco.

However, incorporating various protocols onto the same network for seamless support of data transfer among two or more LANs requires a bridge router, or brouter. Indicative of the kinds of changes going on in this product category are recent enhancements made by Wellfleet Communications, Inc., which include support for 4M-bit and 16M-bit Token Ring networks, source routing transparent support and synchronous passthrough.

With increased interest in reduced instruction set computing-based machines, better LAN accommodations for Unix have also become a major concern. The most talked-about recent development in this area is Novell, Inc.'s Netware v3.11, which was announced in February and is just now beginning to ship in volume.

One key ingredient of Netware v3.11 is its support of communications protocols other than its proprietary Internetwork Packet Exchange/Sequenced Packet Exchange. The most significant protocol stack now supported is the TCP/IP. The TCP/IP support allows Netware servers to

communicate with Unix hosts, which tend to "speak" TCP/IP.

This means "users can integrate DOS workstations with Unix servers and integrate DOS servers with TCP/IP," says Kenneth Zoline, a Chicago-based specialist in mixed-platform LANs.

Netware's new Macintosh Network Loadable Module also provides true AppleLink File Protocol support for the Macintosh. In Macintosh-to-PC connections, reducing the necessity for board-level modifications.

While Novell is garnering a large share of the limelight, it isn't the only networking software vendor offering enhanced portability.

Banyan Systems, Inc. has also made significant strides toward eliminating cross-platform communications snags, says Art Beckman, a Banyan user and manager of information technical services at Pacific Gas & Electric Co. in San Francisco.

"Banyan has a strategic plan to support at least nine front ends and is working on including the Mac by the end of the year," he says.

In the DEC world, both Pathworks 4.0 and DEC's Personal Computer System Architecture 4.0 have expanded to encompass TCP/IP and Network Device Interface Standard, thus improving Ethernet interface support. ■

Unix jumps into the breach

Corporate users, disappointed with OS/2, begin to look at Unix on PCs as a realistic alternative

BY PATRICIA KEEFE

After many years of trying, Unix has finally begun to pique the interest of corporate users. Typically, these are firms that are chafing against the limitations of DOS and eager to exploit a true 32-bit client/server environment, where Unix has a considerable head start on its nearest competitor, OS/2. Almost 3 1/4 years after it first shipped,

OS/2 still falls short, users say. As a result, Unix's superiority in the areas of multitasking, multiprocessing and connectivity has led a number of companies, among them DHL Systems, Inc., Wal-Mart Stores, Inc., K Mart Corp. and a host of Wall Street firms, to build key business and mission-critical applications around Unix. This is no stampede, and the conversions are by and large more incremental than revolutionary. With Unix holding less than one-tenth of the overall business market, widespread hard-core implementations are still years away.

The small number of commercial, Unix-based desktops can be divided into several groups: Those running Unix on personal computers vs. those running Unix on workstations; those who consciously chose Unix vs. those who more or less stumbled into the environment, led by a vertical application; and those running Unix on the client desktop vs. those running it either on a server tied to DOS PCs or as a bonus file multiplexer serving a mix of emulating PCs and dumb or X terminals.

In each of these cases, the latter overshadows the former. One reason is that much of the software that runs under Unix—vertical applications as well as office automation packages—tends to run on dumb terminals or Unix workstations, negating the need for intelligent desktops.

Many popular shrink-wrapped

Keels in *Computersystems*' senior editor, PCs and workstations.

Move it on over

Many of the leading DOS desktop applications have either been ported to Unix or are in the process

WORD PROCESSING SYSTEMS

- Borland International, Inc. — Sprint
- WordPerfect Corp. — WordPerfect 4.2
- Symantec Corp. — Symantec IV
- Microsoft Corp. — Word
- Software Publishing Corp. — OfficeWriter
- Xyquest Corp. — Xywrite
- Ashton-Tate Corp. — Multimate

MISCELLANEOUS

- Autodesk, Inc. — AutoCAD (Computer-aided design)
- Microsoft — Works
- WordTech Systems, Inc. — QuickSilver (Database client)
- Norton Computing, Inc. — Norton Utilities

*Move in progress

Source: Computer Technology Research Corp.

DOS applications are slowly being ported to Unix (see chart). But so far, these packages have not exerted much influence on corporate purchasers.

Do-it-yourselfers

Applications are often written in-house. This was the case at The Toronto Stock Exchange (TSE). In mid-1990, TSE became the first major exchange to automate the chaotic "order book," a record of orders before they trade, which traditionally are screamed out across the floor. It did this by running The Santa Cruz Operation's SCO Unix over IBM and Philips Telecommunications N.V. Intel Corp. 80386-based PCs and a single Compaq Computer Corp. Intel 486 box tied to a Tandem Computers, Inc. VLE.

"Multitasking/multitasking was a key issue for both remote diagnosis and the ability to run multiple applications in a trading environment," says Loren Hicks, TSE's director of floor and product systems. "This is truly a distributed system, and there is really no other way to architect this than through Unix."

Hicks has over 100 keyboards PCs anchored on the exchange floor and running four or five concurrent applications under Unix and Motif.

Traders use a unique touch screen-based application to enter orders; they never see Unix.

It is typical for users to be shielded from any contact with Unix, either through the use of a graphical user interface such as Motif or through a menu shell built into the application.

At San Antonio, Texas-based La Quinta Motor Inns, Inc., interaction with Unix is even more of an arm's length affair. Approximately 205 networked La Quinta Motor Inns are running an SCO Xenix-based package over Intel 386-based Vectras from Hewlett-Packard Co. The DOS-based corporate desktops are tied to a Unix database, server and mail system.

La Quinta Motor Inns chose Unix because it provides the opportunity to

bit of a luxury," he says.

Cost is a concern — Unix applications packages still fetch high prices. Even when users opt to run the operating system on PCs, some expensive extras are usually necessary. Firms that choose Intel 386 or 486 PCs find they must bulk up the machines with additional storage and memory.

Money, money, money

But Unix does save money. When K Mart elected, in 1987, to build a Unix-based in-store architecture around the Intel platform, the decision was based as much on a desire to protect technology investments as on Unix's multitasking capabilities, according to David Carlson, senior vice president of IS.

For Central Fidelity Bank in Lynchburg, Va., switching to Unix has meant being able to run one, rather than three, data lines into each branch to serve three networks. After automating several branch activities, the bank found its DOS server "was not cutting it," says Charlie McVeigh, automation manager for the bank's 400 statewide branches. Switching to Unix increased the number of communications tasks the network could handle without adding software. These include distribution of software upgrades, remote systems administration, host connectivity and peer-to-peer communications via support for LU6.2.

Better than alternatives

Current users look Unix for network and database integration, better server and remote administration and overall greater freedom of movement across platforms and gateways. "A lot of people criticize Unix, but my question is, what else is there better for multitasking/multitasking?" Carlson asks.

A lot more users may be singing Carlson's tune if IBM falls short with OS/2 Version 2.0, slated for release at year's end, and if Microsoft Corp. fails to deliver on its New Technology OS/2 promises. Both appear to be on a collision course with Unix. Easy, a modular next generation of Unix System V Release 4 that is also known as "Unix Lite." It is said that Unix Easy is more modular across the three hardware tiers, sports a better interface and consumes less memory.

User impatience with IBM's Micro-Soft could combine with one of more palatable Unix and more powerful PCs to spur increasing numbers of DOS developers and users to cross over. ■



Carlson: Unix is the obvious choice for multitasking mode

become "a one operating system shop," says Charles Hamlett, vice president of automation systems.

However, the firm probably won't be rushing to discard DOS anytime soon, says Sam Peace, La Quinta's director of IS operations. "Unless there are some major price changes, the cost of Unix on a client basis is a little

CW Chart: Douglas N. Jobe

Even the clones are restive

BY RICHARD PASTORE

After several generations of strict conformity, personal computer clones have begun to mutate. It's a matter of Darwinian necessity. In the days when PC demand outstripped supply, it was enough to copy IBM and slap a lower price on the box. But survival in the commodity world of the IBM work-alike now demands differentiation and innovation.

"We need to make sure our products are differentiated not just in price but in performance," says David Kirkey, vice president of marketing at Advanced Logic Research, Inc. (ALR) in Irvine, Calif.

Time to market is one area in which the clone companies have begun to push the envelope. For example, many first-tier firms moved into fast-forward on production of an Intel Corp. 486-based PC, but AST Research, Inc., was first out of the gate with a native 486 box.

In an even more stunning turnabout at the end of last year, both IBM and premier compatible vendor Compaq Computer Corp. wound up following the clone makers' example, introducing upgradable PCs designed from the ground up.

AST paved the way in early 1989, offering a chance for users to swap the PC's original processors for more powerful successors. A user could buy a machine with an Intel 80386SX chip and upgrade it to a 486. ALR and Everex Systems, Inc. quickly followed AST's lead, producing their own upgradable designs. ALR took it a step further and pushed the upgradable CPU range down to the Intel 80286 level. Two years later, IBM and Compaq are saying they're going to be in that marketplace, so tell me: Who's copying whom?" Kirkey asks.

ing whom?" Kirkey asks.

Clone makers' attempts to differentiate themselves have not gone unnoticed by corporate buyers, who are increasingly looking toward the clones. Computer Intelligence in La Jolla, Calif., reports that in recent surveys, 41% of U.S. firms with 500 or more employees say they plan to buy clone alternatives to IBM, Apple Computer, Inc. and Compaq boxes. And there's some evidence that good prices aren't the only draw.

Stephen Anderson, an information systems architect for the state of Washington, says he has noticed the



M. S. Olson

changes, adding that clone makers' market responsiveness and willingness to innovate are "serious considerations that you have to take into account when you're buying."

Not every attempt at innovation by a clone maker has been successful. However, the near future promises more technological innovation.

AST is working on a multiprocessor-based computer that, rather than following in the footsteps of Compaq's Systempro, will address its own twists to a differing specification. It will debut by year's end, analysts say. (IBM has yet to unveil a multiprocessor-based PC.)

Several clone vendors, including NEC Technologies, Inc. and Acer America Corp., are developing 1992 hardware designs around the MIPS

Computer Systems, Inc. reduced instruction set computing architecture.

Many clone vendors will no longer let others call the shots. Innovative ideas from the small players will benefit users and keep the larger competition on its toes. "I don't think IBM is in any more of a position to set standards today than say other hardware companies," says Michael Krueger, senior manager of advanced systems at AST. ■

Dealers' losses, your gains

Jostling in the distribution channels works to the buyer's advantage

BY CHRISTOPHER LINDQVIST

Change is rampant in the personal computer dealer channel, and purchasers are reaping the benefits in the form of cost savings, convenience and customized service.

Mail-order marketers are offering products and an increasing range of services at prices so low, traditional retailers cannot compete. Superstores give buyers

good prices and the simplicity of one-stop shopping. Traditional dealers, when they aren't rushing to compete on price, are joining the ranks of value-added resellers (VAR) to swell the choices for buyers in search of systems building assistance.

Several factors are contributing to the reshuffling. At the top of the list are rising levels of technical confidence and cost-consciousness among purchasers. Next is the fact that mail-order companies, sensing an opening, have pushed hard and fast to capture more market share.

Gone are the days when purchasing a mail-order system meant trading a good price for poor support and worse service. Today, extended warranties, free telephone support, over-

night delivery of replacement parts and even on-site service are becoming common.

Andy Rifkin, director of research and development at *Time* magazine, says *Time* purchased PCs through local dealerships but shifted to mail order six months ago when it tried to upgrade 200 of its Intel Corp. 80386-based units with plug-in 80386 cards and found the upgrade would cost more than a whole new machine purchased through a mail-order supplier.

Price was a major factor, according to Rifkin, who researched roughly 60 PC brands before settling on PCs from Gateway 2000, Inc. in North Sioux City, S.D. However, in addition to price, performance and quality of telephone technical support were also important.

Superstores are increasingly ser-

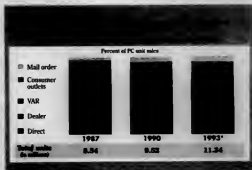
vicing-conscious. Nathan Morton, chief executive officer at computer superstore chain CompUSA, Inc., says purchasers can get as much as they want—from drop-off repair to 24-hour-per-day on-site support.

For some purchasers, however, price is not the issue, and after-the-fact service is not enough. Choices for this group, which wants soup-to-nuts systems assistance, are expanding as conventional dealers develop specialties and transform themselves into high-end VARs.

Businessland, Inc. is one dealer that is trying to cover both ends of the spectrum. Having eliminated its retail business, it is using catalog mailings and a National Order Center in San Jose, Calif., for direct sales to price-conscious buyers. Businessland is also moving aggressively into VAR mode, offering not only consulting but also facilities management.

Intelligent Electronics, Inc. in Exton, Pa., offers other dealers another escape from competitive pressures and possible plummets into what industry observer Seymour Martin refers to as "the bankruptcy gap." The company takes established local dealerships and adds them to its nationwide network.

The result for customers? Familiar faces are offering better prices and big-league support. ■



Source: International Data Corp.

CW Chart: Mary Haines

Lindqvist is a Computerworld staff writer.

Despite his wealth, Phinnias Pritchard lived in a small hovel within the bowels of London's East End. To call him miserly would be entirely too generous. Consider this illuminating example:

Rather than spend a half penny for new candles like everyone else, Phinnias would make the rounds of local establishments, scrape the tallow drippings from old candleholders into a sack, and later melt the contents to make new candles. On one particularly productive evening he collected six scrapings from a pub, four from a butcher's shop, twelve from a church abbey, eight from a neighborhood inn, ten from a local

cockfighting hangar and nine from a cobbler's shop. Query: If it takes the remains of seven candles to make one new candle, and if one candle lasts an entire night, how many full nights of light was he able to create from this trip?

Certainly it's hard to quarrel with Mr. Pritchard's motives. Especially in this era of revered recycling. But, one could legitimately question whether he was receiving an adequate return for all the effort he expended. (Though it did yield in excess of seven candles.)

One could also question what all of this has to do with Wyse.

Believe it or not, quite a bit.

Because—in the interest of ergonomic reform—we are conducting a sort of recycling effort of our own. From May through August we are paying \$50 for any antiquated terminal traded in on a new Wyse WY-150, WY-160, WY-185 or WY-370.

Obviously, we don't actually recycle the parts into our new terminals. But we will see that the old units posed of, then recycle \$50 into your effort. So if you are still cursed with terminals, here's your chance. After all, terminals worldwide in the past how to build new ones.

we are able to offer such standard terminals with



THE WYSE ERGONOMIC REFORM ACT: \$50 REBATE on any old terminal when purchasing new Wyse WY-150, WY-160, WY-185 or WY-370 Terminals. With advanced ergonomics, highest refresh rates, legendary reliability.

recycle the parts into our new terminals. Properly dismantled and dispo-
cket. A nice return for very little
some ergonomically archaic terminals
having shipped over three million
decade, we know a little about

Which helps explain why
a broad line of industry-
a combination of features

and ergonomics unsurpassed by competitive terminals. User-comforting ideas like our unique detachable keyboards with light-touch keys and high tactile feedback. Tilt & swivel monitor bases and higher refresh rates plus overscan video for flicker-free images. All at price/performance ratios that are controller-comforting.

Besides being the largest independent terminal company in the world, today Wyse is also recognized for its broad line of PCs as well as its multiprocessing advanced systems. Probably because we provide the same kind of ergonomics, performance and aggressive pricing that has made us so strong in terminals.

For more information about Wyse terminals, call your local distributor or call us at 1-800-GET WYSE. We'll send you our new Ergonomics Handbook and a poster of more mind-stretching Cerebral Aerobics. Just to help keep your brain flicker-free.

By now the attentive reader has learned two things: Mr. Pritchard's recycling program netted him more than seven candles and Wyse's recycling program can net purchasers several hundred dollars towards the industry's finest terminals.

Don't stop now.

WYSE

More punch per dollar spent

During the past year, high performance and lower prices met head-on

BY JEREMIAH CARON

Change is a constant when it comes to affordability of personal computer systems. From year to year, prices continue on a downward slide, while both performance and purchaser expectations push upward. Some years see bigger shifts than usual, however. This past year has been a special one—not because of any cataclysmic breakthroughs but

because of the coincidence of particularly heavy price competition on the highest plateaus of the technology.

When the first Intel Corp. 486-based PCs came to market in late 1989 and early 1990, most were priced so high that the existing 80386 PC pricing structure did not seem threatened. Before long, however, a number of vendors, including AST Research, Inc., Advanced Logic Research, Inc. and a horde of mail-order firms, challenged the notion that 486-based PCs were just for high-end engineering and local-area network file server applications. These companies priced their desktop 486s low enough to attract corporate power users looking for minimum performance in single-user applications, and they built up their service and support capabilities to a point where many users say they rival or surpass those of the more expensive vendors.

These moves forced major PC players to rethink their pricing strategies, with the result that 486-based systems, which sold for \$13,000 to \$14,000 when first introduced, now cost \$5,000 to \$10,000.

Predictably, as prices of the 486 machines fell, so did those of the 386s. Compaq Computer Corp., for example, has announced significant

and broad-based price cuts twice in the past eight months, bringing its suggested retail to within reasonable striking range of the asking prices of vendors such as Dell Computer Corp. and Northgate Computer Systems, Inc. A Compaq Deskpro 386/25E with a 60M-byte hard disk can now be purchased for \$4,499 or less, for example.

The increase in affordability of powerful microcomputers has not been limited to Intel CPUs. Apple Computer, Inc.'s October 1990 introduction of the Macintosh Classic, LC and IISI models has made corporate purchasers rethink their assumption that the Macintosh was a powerful but more costly alternative to DOS-based computing. In the meantime, Unix users were treated to high-powered reduced instruction set computing-based workstations for less than \$5,000 from a number of vendors.

Price/performance plus

There have also been significant improvements in the price/performance of peripherals. Pricing structures on printer products (particularly laser printers), IBM Video Graphics Array adapters, monitors, add-on memory and communications products were quietly but permanently rearranged over the past year as new technologies emerged and existing ones became less expensive.

The entry-level price of high-quality output was significantly lowered in the past year by the emergence of

See how they've dropped

A four-vendor look at recent price trends

Prices represent averages based on long-term tracking of roughly 20 vendors

	1/89	4/90	1/91	5/91
LOW-END				
16-MHz 386SX PC with 1M-byte RAM, Video Graphics Array (VGA) graphics and 40M-byte hard disk	\$4,000	\$3,600	\$3,200	\$2,800
MID-RANGE				
25-MHz 386 PC with 2M-byte RAM, VGA graphics and 100M-byte hard disk	\$7,500	\$7,000	\$6,000	\$5,000
HIGH-END				
25-MHz 486 PC with 4M-byte RAM, VGA graphics and 300M-byte hard disk	\$11,500	\$13,500	\$11,250	\$9,500

CW Chart: Dennis St. John

"personal" laser printers, most notably the Hewlett-Packard Co. Laserjet IIP, Apple Personal Laserwriter LS and IBM Laserprinter E models.

These products—which sell for less than \$1,500—make laser printing more affordable, although supplies, such as toner cartridges, are still fairly expensive.

Affordable at last

Memory can now also be termed "affordable." Both IBM and Compaq dropped prices on their 32-bit memory expansion boards in late 1990, and most users can inexpensively increase system random-access memory to the levels required by many of today's advanced software products, including Microsoft Corp.'s Windows and Lotus Development Corp.'s 1-2-3 Release 3.1.

Software is one area where prices generally vary little from year to year. For the most part, this means continuously improving value because new features and functions are often added to new versions without major alterations in selling price.

Of course, soft-

ware developments do tend to increase costs for purchasers in terms of the need to configure or replace hardware or to purchase additional software to take full advantage of new capabilities. The \$149 Windows package is a case in point. Many of the estimated 3 million units sold have forced their users to upgrade their existing PCs with more RAM, more powerful processors and new graphics adapters or to buy completely new systems based on the 80386SX or 80386 CPU.

The bottom line, however, is that this has been a good year for PC purchasers. The current generation of "affordable" PCs, both the DOS/Intel CPU and most of the Macintosh line, are based on 32-bit microprocessor platforms. This is a key corner to turn because it means that before very long, even low-end PCs will be able to multitask applications, access large amounts of memory and support a whole generation of advanced applications and environments. ■

Caron is senior editor of "Faulstich Reports on Microcomputers and Software" and "Microcomputer Communications," published by Faulstich Technical Reports in Paramus, N.Y.

Low-priced? Affordable?

Changes in the PC industry during the past year came thick and fast—and largely benefited the consumer

Event	Effect on price	Effect on quality	Effect on availability
Compaq Computer Corp. Deskpro 386 price cuts	Positive	Positive	Result of pressure on Deskpro 386 sales from low-cost vendors. Caused further overall 386 price drops, even from IBM.
Apple Computer, Inc. Macintosh Classic, LC and IISI introduction	Positive	Positive	Effectively reduced entry price point to Macintosh environment. New low-cost systems will support System 7.0. Success encouraged Apple to lower high-end Macintosh prices.
Major vendors offer low-cost laser printers	Positive	Even	Laser printing capabilities now available to individual and small-business users. May tempt users to purchase lower-cost laser printers even though they are still much more expensive than dot-matrix models and exact a higher consumable cost.
Microsoft Corp.'s Windows 3.0 introduction	Even	Negative	Many new Windows users require hardware upgrades, new applications and additional training, which can significantly reduce overall affordability of a Windows-based environment.
Advanced Micro Devices, Inc. AM386 clones introduction	Even	Positive	Prices of systems based on faster AM386 chips may not be noticeably different than for slower Intel Corp. 80386-based products. Effect on affordability should be positive, however, as Intel answers clones with 486SX chip, further pressuring overall 386 pricing.

CW Chart: Mark Steiner



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 11 HOPKINTON, MA

POSTAGE WILL BE PAID BY ADDRESSEE

Avatar Corporation
65 South Street
Hopkinton, MA 01748-9967



**GIVE ME 30 DAYS FREE
WITH MACMAINFRAME.**

- ☐ Yes, call me to arrange for my free 30-day trial of MacMainFrame.
☐ I'd like to learn more about using the Macintosh as an IBM terminal.
Please send me more information about the MacMainFrame Series.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY/TOWN _____
STATE _____ ZIP _____
BUSINESS PHONE _____

Avatar

MCW2



Macintosh LC and MacMainFrame are trademarks of Apple Computer, Inc.

Replacing your 3270 terminals with a Macintosh looks more attractive than ever. Especially with Avatar's special offer on MacMainFrame for the affordable, high performance Macintosh LC.

MacMainFrame is the Mac-to-mainframe connectivity product that combines the best of the Macintosh with the IBM mainframe for Coax, Token Ring and SDLC networks. Shipping now for

the Macintosh LC, MacMainFrame has features like terminal emulation, file transfer, copy and paste, 3287 printing, keyboard remapping and support for multiple sessions.

The offer?

We will send you MacMainFrame free for 30

days so you can evaluate it yourself. When you do, we'll give you

a coupon good for \$50 off the purchase of MacMainFrame Coax Workstation or Gateway for the new Macintosh LC.



It's easy, too. Simply unplug your terminal and plug in your MacMainFrame equipped Macintosh LC, and you'll be connected to your main-

frame as if you had a terminal. Except you'll have MacMainFrame and a Macintosh LC. And wouldn't you rather have that instead?

Call 1-800-AVA-3270 today to take advantage of our 30-day MacMainFrame free trial offer. Or send in the attached reply card. You'll see that replacing your terminal with MacMainFrame and a Macintosh LC has never looked better.

**THE 30-DAY MACMAINFRAME
FREE TRIAL OFFER. 1-800-AVA-3270.**



on factory floors, where the computerized control of complex machinery can be reduced to pointing. The touch screen gives an industrialist added value by virtually negating the need for worker training — no one needs to be taught how to use his finger.

Another market pursued by touch-screen vendors is the executive suites of corporations, where nontechnical users need access to corporate information.

Stretching the appeal

Recently, several manufacturers have come out with touch-screen software that emulates a mouse, a development that may serve to broaden the appeal of this technology.

Monitormouse from Elographics, Inc.

in Oak Ridge, Tenn., the largest maker of touch screens, allows a touch screen to replace a mouse or to work in conjunction with one. When used in the Windows environment, Monitormouse can be used to raise windows, pull down menus or activate commands. When the finger is held still, the program switches into the drag mode so you can drag objects across the screen with your finger the way you can with a mouse.

Touch-screen prices, which were once prohibitively high at approximately \$1,000, have dropped gradually during the last two years. You can now buy an Elographics touch screen for as little as \$265 — but add at least \$99 to that for Monitormouse or other software.

Even though touch screens have been

around for a long time and are widely used — Elographics has 100,000 in the field — these devices are not totally trouble-free.

Many users report difficulty with registration in the setup of the screens, which means it is hard to align the coordinate systems of the touch screen with that of the graphic display. Interactive video producer Edgar Shriver at Kinton, Inc. in Falls Church, Va., reports registration problems in the setup of the screens are "a lot of bother."

Ergonomics can also be something of an issue. Some users complain about tired arms and sore fingers. "Banging your finger against a screen all day hurts," Shriver observes, noting that he's seen some users who initially demanded touch-

screens convert to mice for that reason.

Touch technology is also starting to show up in nonscreen contexts. Microtouch Systems, Inc. in Wilmington, Mass., has transferred touch direction to a desktop tablet similar to the digitizing tablets used by engineers, draftsmen and designers to produce with a hybrid input device called the Umouse.

The Umouse is a miniature (3-in. by 4½-in.) touch-sensitive tablet with a resolution of 1,000 by 1,000 touch points, or points the computer will recognize through the touch of a finger, a pen or the supplied stylus.

As with full-size tablets, the Umouse can be used for drawing, tracing or entering signatures into computer documents. By sliding templates under the glass, it becomes a programmable keypad. If the user prefers, the tablet can be switched into mouse or trackball mode. It costs \$235.

Developing forms of expression

With the advent of pen-based operating systems from Microsoft and Go Corp., some observers say that in the near future, users will see some sort of digitizing tablet on almost every desktop. The pen-based systems that will emerge from Go and Microsoft technology will be sophisticated enough to recognize complex written "gestures," which is how they recognize handwriting. For instance, the curve of a U would be considered a gesture.

dTruth Comes Out.

Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

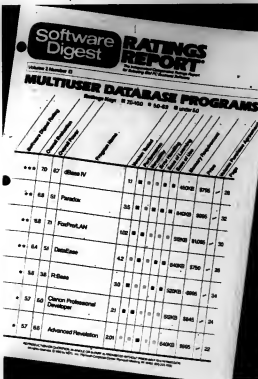
For a free evaluation kit, including competitive details and a free demo disk, call toll-free:

1-800-437-4329 ext. 1416

Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV NOW.

The truth is, no other database can do so much to improve productivity

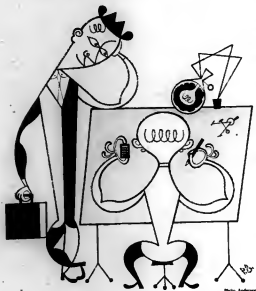
 Ashton-Tate



dBASE IV

Do 10,000 minnows = a whale?

No new blockbuster applications on the horizon but lots of fresh twists and technology extensions



Phil Anderson

BY ALAN J. RYAN

If there is a 1990s equivalent of Visicalc on the short-term horizon, its outline isn't apparent yet. That's a disappointment to many who say it is time for another great leap in personal computing, another breakthrough application that will set off a sustained buying boom.

In the meantime, however, there are significant —

albeit less resounding — strides being made in a number of key areas, and these incremental developments may ultimately provide more substantive roles for PCs than any single game-changer application. Here are a number of areas to watch:

• **Transportable models.** Notebooks and laptops are being turned from bare minimum travel conveniences into all-purpose machines.

"We are graduating into the next generation of products based on the 80386SL chip from Intel Corp.," says Bruce Stephens, director of PC hardware research at International Data Corp. in Framingham, Mass. Without question, he says, "we will see a lot more power management features in the notebooks, so users will be able to run the machines longer."

They'll also be able to run them harder for a lot less, says Mark Minasi, a partner at consulting firm Moulton, Minasi & Co. in Columbia, Md.

Ryan is a Computerworld senior writer, features.

"For \$2,000, you'll be able to buy an 80386SX-based notebook [this year] that will include 4MB of random-access memory, a 60M-byte hard disk and a coprocessor socket." At those prices, Minasi says, it is likely that companies will begin looking at the tiny computing units as replacements for full-size desktop models.

Also in the cards for laptops are higher capacity, 2½-in. hard drives. The norm will increase from 60M to 80M bytes, Stephens says, and there is even talk of vendors going beyond 80M bytes within the next year.

• **Pen-based systems.** The release of high-function pen-based systems will open even more doors for an increasingly mobile work force.

High-function stylus-based computers based on Go Corp.'s Penpoint operating system, expected late this year or in the first quarter of 1992, will be as exciting as the early Apple Computer, Inc. Macintosh, says Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif.

Microsoft Corp. is also working on a high-function, stylus-based operating system called Pen Windows and has already distributed more than 200 developers kits. The company says 21 OEMs have announced support for Pen Windows, and products may start to ship in early 1992.

While companies such as Grid Systems Corp. in Fremont, Calif., already offer stylus-based units for applications such as insurance damage reports or retail inventory control, those products only scratch the surface of pen-based possibilities. When the Go technology is incorporated into laptop units (the company is working with several vendors), it will work with a wider range of applications, such as word processing and spreadsheets, a Grid Systems spokesman says.

Saffo, however, says what will really bring the promise of pen-based operating systems to fruition will be the eventual combination of that technology with advances in wireless communications. "It is the combination of the two that is exciting — a slate-like device in your briefcase with a built-in cellular modem," so users can send and receive faxes or upload or download anything that is available in your office, he says.

• **Expanded storage.** Users can also expect to see many more desktop and portable devices that use compact disc/read-only memory (CD-ROM) technology now that prices on CD technology are dropping, says Kurt Mueller, founder and president of Dataverse Technologies, Inc., which makes authoring systems for publishers creating CD-ROM applications.

The really exciting developments will be in the area of low-cost, write-once CDs, Mueller says. "Write-once technology is available today in the \$30,000 class, and that is expected to drop to the \$2,000 to \$3,000 range this year or early next year."

If that happens, he says, write-once technology could become a practical and affordable tool at the departmental or even individual user level for applications such as electronic publishing, work-group computing, improved archival applications and transaction processing.

• **Windows and OS/2.** Charles Foundryer, president of Darastech, Inc., a consulting firm in Cambridge, Mass., says he expects to see Version 3.1 Windows arrive in the third quarter. The upgrade to Windows 3.0, he says, will eliminate some of the bugs in Windows and will include more utilities.

He adds that Microsoft may deliver Version 2.0 of OS/2 this year, which is expected to have direct execution of Windows applications programming interface calls. That feature would allow users to take

Windows programs and run them in standard mode under OS/2.

• **Combination specialties.** A number of technological strains are beginning to converge, producing products that challenge old ideas about the PC's place.

One product of this type that is expected to hit the market this year is Red, from Reddy Information Systems in Berkeley, Calif., and New York, Red, which might be best described as a personal, portable multimedia information system, also features a portable CD-ROM drive and a proprietary display processor.

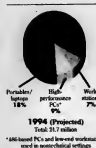
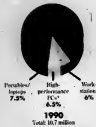
The unit, initially targeted at jobs such as aircraft maintenance, where the user's hands must remain free to perform work, essentially projects an image onto the user's retina so that the image — in this case, a maintenance manual page — appears to be floating in space in front of the user. The unit clips onto the user's belt and has an external battery pack that lasts four hours.

Fax technology is also making its way into an assortment of other technologies. Announcements of superfax machines that have copying capabilities, laser printing capabilities and the like have already been made and will continue throughout this year and into the next. ■

Rising mobility

During the next few years, portables and laptops will make the greatest gain in desktop sales

Percent of worldwide unit shipments of microcomputer systems



▲ IBM-based PCs and lower-end workstations used in noncritical settings

Source: Electronic Trends Publications

AN OPEN LETTER TO OUR CUSTOMERS

There has never been a merger like AT&T and NCR.

By bringing together two major forces—one in commercial computing and the other in global telecommunications—we intend to play a leadership role in enterprise-wide information systems and services. Our vision is this: to create global computer networks as easy to use, as efficient, and as accessible as the telephone network is today.

Only a unique company with superior and dedicated people can realize this vision. We intend to be that company.

As an expanded organization with a substantial international presence, we will provide you with many benefits, including expertise in a wide range of information and interface technologies, increased financial resources, quality manufacturing, extensive support capabilities, worldwide network facilities, and a superior range of products and services.

AT&T's Networked Computing Architecture and NCR's Open, Cooperative Computing Architecture are an exceptional fit. Our common approach to networked computing, focused on open systems, is designed to protect your investment as technology evolves.

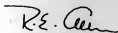
**SO YOU CAN BUY EITHER AT&T'S OR NCR'S PRODUCTS—RIGHT NOW OR IN THE FUTURE
—WITH CONFIDENCE.**

We recognize that everything begins with creating value for you. Therefore, we promise:

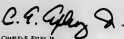
- ☐ To understand your business and its information requirements;
- ☐ To build upon our long-standing corporate traditions of innovation and service;
- ☐ To provide superior value in all our products and services;
- ☐ To offer computer and communications systems that effectively act as one.

We have high expectations for the merger of AT&T and NCR. You should too.

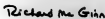
Thank you for being our valued customers.



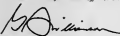
ROBERT E. ALLEN
Chairman and Chief Executive Officer, AT&T



CHARLES E. ESELY, JR.
Chairman and Chief Executive Officer, NCR



RICHARD A. MCGINN
President, AT&T Computer Systems



GILBERT F. WILLIAMSON
President, NCR



The whole world in your hand?

Pundits see a day when computer users will be able to do almost everything, almost everywhere

BY ALAN J. RYAN

If computer industry visionaries are correct, the not-so-distant future of personal computing will bring a truly global and mobile information marketplace where users can access and share information from nearly anywhere using a cellular phone and a personal computing "appliance."

As more companies look for ways to reduce overhead,

and as technologies such as compact disc-read-only memory (CD-ROM) and cellular communications continue to improve in price and performance, the idea of a mobile work force requiring little office space is expected to become a reality.

It is not unlikely that within the decade, users carrying one powerful handheld computing appliance — featuring fax, photocopy, telephone and CD-ROM capabilities — will have access to all of the information they need simply by plugging into "landing sites" or "information turkeys."

The users' telephone numbers will be their mobile work and leisure address, at which they will be able to be reached 24 hours per day via electronic mail. In the long run, says Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif., "the workstation is going to become like a telephone, where the essential value is derived from what it is connected to."

Some of the developments expected during the next several years that will help to bring about this altered reality include the following:

• **Cheaper optical:** Low-cost read/write optical is just three years away, says Mark Minas of Moulton, Minas & Co. in Columbia, Md. "With storage technology, we're seeing some breakthroughs. For instance, Tandy Corp. recently announced a list price of \$399 for its CD-ROM. Once CD-ROMs bust the \$200 range, I think it becomes reasonable," he says.

However, one of the surprises for the remainder of the decade will be that the cost and performance of magnetic and optical storage will stay pretty much even, Saffo says. "We won't scrap our magnetic drives wholesale for optical. Each has a complementary role to play," he says. • **Portable office resources:** The function of the desk is going to change, says Lee Felenstein, vice president for research and development at Reddy Information Systems, which has offices in New York and Berkeley, Calif.

Felenstein, who designed the portable Osborne 1 computer, says users

will be able to carry with them large portions of what they used to keep in their desks and on their bookshelves.

"That makes possible modes of interaction between the information system of the organization and the actual functioning, productive parts of the organization," he says.

• **Expanding documents:** Information will be relayed in the most practical way, whether it be a folded piece of paper in a person's pocket or a screen full of text on a wall, says Bob Spinrad, director of corporate technology at Xerox Corp. and a veteran industry observer.

Users will become more indifferent to the media employed and more concerned with the information contained therein, Spinrad says. Combined imagery that may include

live material and stacked in an array of pages. To reconstruct a captured page, an electronic beam would be aimed at the stack at the proper angle to capture the correct page and retransmit the data electronically.

Initially, Wilensbrink says, the technology would be very expensive and would likely make its earliest inroads in high performance applications such as multimedia, transaction processing, military/aerospace industries and supercomputing. However, once the technology gains acceptance and prices drop, it has the potential to reach right down to PC markets. Wilensbrink says prototypes may be ready in three to four years.

• **Intelligent conference rooms:** Conference room decor will become truly high tech, according to Samuel Blecker, a technology consultant at Blecker & Associates in Boca Raton, Fla. "The conference room is now going to become an information war room" where participants will share information through flat screens built into the table.

Attendees will come to the meeting and plug in their CD-ROMs so they can look through their information databases to respond to questions. They will also be able to pull up studies, charts or full-motion videos and display them on all of the screens in the room. For conference calls, the user will be able to point and click at the faces of the people he wants to include in the meeting, Blecker says.

• **Resource sharing:** Another MCC project with big potential implications for PC users is called the Experimental Systems Project (ESP).

Don Bynum, director of business development at the experimental systems lab at MCC and project manager of ESP, explains that the project revolves around the notion that a few hundred commodity microprocessors can do a bulk of the work that currently requires a supercomputer.

"We don't believe there is any functional difference between processors packaged as workstations on a LAN and a closely coupled parallel computer," he says. The trick is figuring out how to harness PC power to perform the same kinds of complex tasks.

As a point of comparison, Bynum says, one Texas university is planning the purchase of a \$16 million supercomputer. "For \$16 million," he says, "you can buy about 8,000 386-based PC workstations with 1M byte of memory, a 40M-byte hard disk and a VGA monitor."

Furthermore, he says, if you compare this amount of PC power with a

supercomputer, you find that with that many PCs, you have 180% of the MIPS (millions of instructions per second) that a supercomputer would theoretically offer, nearly 100% of the millions of floating-point operations per second, two orders of magnitude more disk space, three orders of magnitude more aggregate bandwidth and one order of magnitude more random-access memory.

Ironically, Bynum says, an average of 5% of all PC MIPS available are actu-



Felenstein: The work space will be wherever you are

ally being used. ESP is studying ways to harness the unused computer power of PCs and to share the excess MIPS throughout an organization.

ESP, which already has a working prototype, is expected to produce results before 1993, Bynum says.

• **Integration:** Phase 1 in the sociology of the computer industry was implementing new technology along old lines, Felenstein says; now, it should become possible to interlink those technologies in new ways.

Integration won't make individual computing units any bigger, he says. The emphasis will be on modularization so users will be able to employ ever-smaller purpose-built units that can link into larger systems as necessary.

One large-scale integration effort already underway is the Carnot project at MCC, whose objective is to allow existing mainframe-based data resources — large databases — to interoperate with open systems, including PCs.

According to Ron Riedesel, director of business development for the project, the goal is to take corporate data accumulated across global corporate operations on various incompatible systems and build a bridge between the closed centralized systems companies have invested in and the open, distributed systems of tomorrow.

Some prototypes of Carnot technology are expected this quarter, but more complete systems will be released during the next three years. •



John C. Green

handwritten notes, sound files, still photos and more will all be included in the documents, he says. Some of the linking of video, sound and text is already here today through multimedia, he adds.

• **Holographic storage:** The Microelectronic and Computing Technology Corp. (MCC) in Austin, Texas, is a cooperative research and development enterprise whose mission is to strengthen and sustain the competitiveness of member companies in information technology. MCC is home to many leading-edge developments. Among them is a brand-new project to develop holographic storage. The way this work will expand, explains Jerry Wilensbrink, program manager of the optics in computing program at MCC, is that images of pages will be captured onto tiny crystallites of photorefractive

The personal stuff is great, but . . .

We're missing the connections, says the man who thought up much of what makes PCs useful

You may not recognize the name Douglas Engelbart, but if you have ever used a word processor, a database, split screens, windows or a mouse, you know a little about how his mind works: Engelbart is the person who thought up all these "modern" conveniences. Of course, he thought of many of them 40 years ago, about the time he conceived the

idea of a desktop computer.

But all of those things are only bits and pieces of Engelbart's real work. He continues to receive honors for them — most recently the 1991 Coors American Ingenuity Award — but so far, few people have grasped the big picture he keeps trying to draw. Since 1951, Engelbart has been chasing a vision of a structure and a set of tools that will allow organizations to become self-powered engines for ongoing knowledge creation.

It's a pretty complicated idea, one in which the personal computer is the individual workbench in what Engelbart calls the "knowledge workshop." The gist is an environment where information in multiple forms can be shared, combined and augmented across all kinds of organizational boundaries.

Knowledge augmentation is a primary theme, which is why an early prototype system Engelbart created back in the 1950s was named Augment. That system took shape when Engelbart was working at the Stanford Research Institute (now SRI International). He and Augment have moved around quite a bit since then. The system was sold to Tymshare, Inc. and then acquired, along with Tymshare, by McDonnell Douglas Corp., where Engelbart also worked. Now McDonnell Douglas has agreed to license the system to The Bootstrap Institute, an entity Engelbart created to explore his ideas about how organizations can use distributed online environments to perform collaborative knowledge development.

When Engelbart looks at the PC world, he views it not in isolation but as part of that larger concept. *Computerworld's* features editor, Joanne Kelleher, asked him to share that view with us.

Although he sees great progress in microcomputer technology, Engelbart says there is long way to go in using it to best advantage.

"I'm always struck by how much catapulting development is going on in microcomputers and microcomputer software, with more power and more variety in the utilities being offered and the little auxiliary hardware things. The real problem, though, is that I'm going to be figuring out how all that stuff can be integrated coherently into what you could call the organiza-

tionwide or enterprisewide knowledge workshop. That's the sort of preface or special eye with which I look at this.

"Trends like the movement toward standards in windows systems and the growing interest in groupware are encouraging. But I don't find a sort of comprehensive picture yet out there . . . the kind I'd like to see."

The dynamics of the market will have to change to accommodate enterprisewide information sharing and collaborative work, Engelbart says:

"It is going to be a very different marketplace for both vendors and the buyers of hardware, software and network. I say that because of the rate of change that is going to be required in organizations to really learn how to harness the technology, as well as the expense and amount of internal adjustment required."

"Right now, the way the market works is that vendors bring out products, people try them, and they start learning. Then vendors start trying to improve their products and to follow the successful things that other vendors are doing. But you can't restrain everybody to go from one global software product to another, radically different one without a lot of expensive internal changes."

"Operating this way is a tremendous new frontier in terms of new kinds of rules, relationships, working modes and conventions for knowledge distribution. It is going to be expensive to design and implement all that, and if you know a lot more about what you were going to do, it would be one thing, but all that is just unexplored territory right now. In that kind of environment, vendors can't just come out and lay something out on the table and say, 'That's our new product.' The large user organizations will have to become more proactive."

Ease of use is fine, he says, but doesn't see how the whole organization by making everyone work at the most primary event:

"I don't have anything against making

it easy to learn, per se. What I say is, if you are really going to look for really peak performance in your organization, you have to be very careful not to limit everybody to the sort of system that is easy for the uninitiated to learn or easy for the more casual or occasional user to use."

"It is important to provide accessibility for these people, but if that's what dominates your approach to your whole system, then everybody is going to go around talking Pidgin English. For large organizations, it is important to think in terms of dichotomy — a shared vocabulary, with variety in the styles of interface."



Engelbart says the next task is to integrate PCs into an organizationwide environment for knowledge creation.

PCs haven't lived up to expectations in terms of productivity because they aren't being used collaboratively:

"One big part that's missing is the working methodologies and conventions that would enable PC users to come effectively into the larger work group. The personal computer came in to help people do their isolated stand-alone stuff, but the interoperability between them is in a very bad shape. Having things on floppy disks or whatever kinds of disks is just no way to collaborate."

"Network file servers, where you can make part of your work available to other people, will help. But you have to give a chance to the really new style of work . . . new roles, new modes of organization, new modes of management, modes of reporting, sharing and integrating specialists into the work force more effectively."

Our definitions of information sharing are expanding:

"As network capacity grows and storage capacity grows, more and more use is going to be made of the whole spectrum of media, including real-time color video and photo quality stills and digitally recorded speech."

"Right now, we only have the word document available to talk about this kind of purposeful sort of knowledge bank, but the documents involved in the kind of hyperinterconnections that you are going to need to be interoperable effectively will be very different. For example, E-mail will only be one part of the generalized hyperdocument."

Visualizing new ways of applying technology has always been difficult, and the further out you look, the fuzzier the frame of reference can become:

"Inertia or lag is a very general characteristic. Your mind can only really be analytical about how everything works in a limited domain, or else there are just too many gears and wheels spinning in your head. So some parts of the world you just sort of take as is and go charging along."

"If there are things changing over there that haven't been part of your perception of the candidates for change, then it is just hard to take them in until some experience lifts you out of your old rut."

"I would make verbal descriptions of desktop publishing or [computer-aided design] systems back in the '60s, and people would say, 'Gee, that's exciting — that's great.' But it would not sink in as being real to their world. It never does until there comes a time at which they can experience it somehow. Then it starts to be real."

"Part of the problem, too, is that if you are talking about downstream possibilities, no matter how accurate your vision might be, you don't have the vocabulary in today's lexicon to describe it. So it takes several paragraphs to set the stage for one term you are going to use."

"Do this for a couple of terms, and there you are, two pages later, and people aren't used to being dealt with that way. They are used to using terms they already know. This is a very basic problem, and somehow we have to find ways to deal with that if we are going to get our organizations to start being able to evolve with enough timeliness to take maximum advantage of technology."

"The kind of change rate that is coming about is so much larger than our organizations have ever had to deal with."

See a hero.

Be a hero.

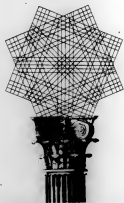
She saw a terrific opportunity.

He solved a thorny problem.

The key for them--and others like them--was information technology.

Be there when the world leaders in this field gather to salute those individuals who have used information technology to make the world a better place.

Join master of ceremonies Ed Bradley of CBS' *60 Minutes* for the celebration honoring this year's winners.



**The Third Annual
Computerworld
Smithsonian Awards**

Call (617) 349-3704 or mail the coupon below. Make checks payable to:
Computerworld Smithsonian Awards, 11A Mount Auburn Street, Cambridge, MA. 02138

**Yes! I would like to reserve the following seats at
The Computerworld Smithsonian Awards Dinner**

Table of ten
\$ 10,000 _____

A pair of tickets
\$ 2,500 _____

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

**6:00 PM June 10, 1991
National Building Museum
Washington D.C.**

Course of action: Readyng IS students for the real world

Schools tie what they teach to what companies say IS grads need to know

BY LUCIE JUNEAU

In an industry in which some product life cycles are measured in months rather than years, it's tough for companies to keep up with the latest changes. That effort is just as difficult for technical and business schools producing the next generation of information systems professionals and managers. These schools are reaching from their ivory towers into the real world to give their undergraduate and graduate students what they need to make it in IS. But it hasn't been easy.

Gordon Davis, chaired professor at the University of Minnesota's Carlson School of Management, says he sometimes feels as if he's riding "a speeding train."

Keeping academia up to date with what's happening in business requires a some fact-finding effort. Schools that hope to provide students with state-of-the-art technology and applications provide opportunities for formal and informal faculty contact with the business industry. This contact also helps them match their curricula and degree requirements to changing business needs. Seminar and lecture series featuring industry speakers are popular, as are corporate affiliate programs that support research.

The best faculty members stay up to speed — or pull ahead of the crowd — by taking advantage of many of these departmental activities. They work as consultants and conduct their own research, interact with professional and academic colleagues through professional societies, maintain an extensive network of professional and academic contacts and keep up with IS journals and relevant periodicals.

Staying up to date

To keep students up to date with changes in industry, faculty members revise course materials frequently and invite executives into their classrooms as guest lecturers.

Inviting representatives of the business community into the classroom as lecturers is a popular way of keeping students in touch with real-world issues.

Juneau is a free-lance writer based in Salem, Mass.

Students are eager to hear what practitioners have to say. IS professors report. Although it's important that students learn about the latest information technology, it's even more valuable for them to hear how the technology is being used in the business environment, the professors say.

Addressing the systems and design class at the University of Texas, Walter Viall, director of Texaco, Inc.'s IS enabling center, was able to give students an overview of the top computer-aided software engineering (CASE) products on the market. Texaco's enabling center is responsible for acquiring CASE software for Texaco, says Eleanor Jordan, associate chairwoman of the management sciences and IS department at the University of Texas.

Of even greater benefit were Viall's remarks about resistance to the new technology, Jordan says. Some students, she adds, were surprised to hear that "you don't say, 'Here's this wonderful tool,' and everybody says, 'Great, give it to us.'"

Build a bond

Finding good speakers doesn't have to be difficult, says Sirikka Jarvenpaa, director and adviser of the IS Ph.D. program at the University of Texas. "Getting good speakers is a matter of relationship building," Jarvenpaa explains. Her research has put her in contact with people in the IS community, many of whom have agreed to speak to students. For the relationship to work, Jarvenpaa makes sure those involved feel the information exchange is going to be worthwhile.

She usually arranges a luncheon in which the speaker, faculty members and students can interact and swap ideas, and "sometimes I even give student resumes on to the visiting person," Jarvenpaa says.

However, there are occasions when some speakers miss the point. "Often times,

[speakers] try to take the role of the professor and have a highly structured lecture extracted from literature rather than presenting something from their own experience," Jarvenpaa says.

Some universities lure industry leaders to their campuses by offering special academic programs designed for executives.

At MIT's department of information technology, executives spend a semester or a year as visiting scholars. Robert Goldberg, one of the founders and a former vice president of marketing at software firm



Rob Saunders

BGS Systems, Inc., is currently at MIT serving as an adviser to faculty and students, says Stuart Madnick, the John Norris Maguire professor of information technology. "Bob Goldberg brings a strong sense of what's going on in industry and what education should have," Madnick says.

Just up the road from MIT, Harvard Business School runs an annual two-week program for chief information officers from major firms called "Managing the Information Services Resource." Teaching this

Continued on page 114

- Business community input on curricula
- Hands-on research, consulting a must
- Do IS chiefs think grads are better prepared?

Continued from page 113

program keeps faculty members sharp, says Professor Warren F. McFarlan, director of research at the school. "If you're off-base on what's happening in industry, you'll get instantaneous feedback," he says.

Harvard also runs an 11-week residential program for 160 senior executives, McFarlan says. This advanced management program forces faculty members to confront the newest applications, he says.

Curricula considerations

The interactions faculty members have with their corporate peers help shape the academic curricula.

"At UCLA, we used the corporate members of our associates group as a sounding board to develop a syllabus for a course on office automation. We were breaking new ground at the time seven years ago and wanted to know what to emphasize. Their input largely shaped the course we taught," says Georgia State's Ephraim R. McLean, formerly a member of the faculty at UCLA.

However, McLean warns, there can be problems with applying industry input. For example, practitioners don't always agree on what skills should be taught. "Some say give them more technical skills. Others say they need more management training," he says.

New York University (NYU) revamped its IS curriculum two years ago to keep pace with the industry, says Jack Baroud, director of undergraduate studies at NYU's Stern School of Business. Based on yearly meetings with 15 affiliate firms, undergraduate offerings include courses in advanced software, Unix and expert systems, he says.

"We de-emphasized the programming aspects of our course and made C++ and C Unix available but not required. The only language they must take now is Pascal," he says. These changes were implemented because many companies are now using packaged software or fourth-generation languages, Baroud says.

On the graduate level, the school has

Are grads better prepared for business?

Business and technical schools are working to keep academia in tune with what's happening in business. Do IS managers think the caliber of students coming into the IS workplace has been affected by that emphasis?

KENT STAPLETON
Manager, IS development
Henry Heald Corp.
Hershey, Pa.

Most graduates we see are technically well-qualified and have exposure to business issues through MBAs or other means. They understand when you talk about accounts payable or receivable and sales force automation.

I attribute the fact that they're more business-qualified to the fact that colleges and universities recognize there is a difference between information systems and computer science.

Because I have had the opportunity to work with an advisory committee at Pennsylvania State University, I know schools are getting IS managers' input and tailoring their curricula to address what we're looking for. Students we hire from Penn State work on a senior devel-

opment application. What they've got to do is identify a business need and develop a business solution using a computer for assistance.

BARD WHITE
Worldwide director of MIS
Spaulding Sports Worldwide
Chicago, Ill.

I find that it's still tough to get the most out of graduates coming directly from a school environment. We've still got to put them through fairly extensive training in the way we do things here — in hardware and software and our own way of analysis. Getting someone used to our culture is key. That has nothing to do with the technical tools they bring on board.

We put a lot of emphasis on hands-on experiences such as research projects and case study. If you sit in a computer science class and learn a compiler, that's terrific. However, if you've worked on actual projects, that's even better. But for some reason, I'm seeing less practical experience. As a matter of fact, I used

to get two or three calls per semester from schools wanting to send a class down and talk to me about what we're doing. Now I don't get any.

SID DIAMOND
Vice president, worldwide
information services
Black & Decker Corp.
Towson, Md.

I think students are better prepared to go into business today than they were five to 10 years ago because the colleges have changed the curricula in the computer science areas to broaden them more from a technical base — operating systems, advanced programming languages — to a more business-oriented approach.

As a result, students coming into a business environment are more aware of the things that occur in manufacturing or marketing or sales.

I think students are getting summer jobs and doing research projects at corporations so they have a better knowledge and insight into business.



developed a special course called "Emerging Technologies" to help students learn about cutting-edge developments in IS, says Edward A. Stohr, chairman of the IS department at the Stern School of Business. "We invite people who are experts in the technology into the classroom for one or two lectures, and people who've gone through the process of applying the technology in the organization come in to teach another one or two classes," he says.

The idea behind these glimpses of real life is that students will be better able to understand the technology and its business applications, Stohr says. Current topics in the course include electronic data interchange and neural networks as well as imaging and other electronic paper-replacing systems.

Harvard Business School updates the business case studies used in its MBA program on a regular basis, McFarlan says. "In one required information technology course, 'Information Organization and Control,' we use 12 to 13 new cases a year," he says.

Keeping up with Professor Jones

Most universities encourage faculty members to work on their own research. "There's an unwritten allowance that 20% of a faculty member's time may be dedicated to professional activities. That's a euphemism for one day a week to do consulting," McLean says.

In addition, because most faculty members have no teaching assignments, they have at least three full months to do research on campus or in the field, he says.

Research and consulting are often the same thing, Davis says. "I look for consulting projects that have a research application," he says. "The ideal type of consultation is one where the client gets a practical result, and the faculty member keeps an eye on a business problem they ought to be looking at," he says.

Students as well as professors find value in getting right into the business set-

ting. At the University of Michigan, students participate in executive projects that combine research and consulting.

"Students get to see real problems in the real world; companies get hard-working MBA students to bring fresh insights. Sometimes the emperor doesn't have clothing, and it takes someone from the outside to state the facts or ask 'dumb questions,'" says Dennis G. Sewerance, professor of computers and IS.

Consulting brings faculty members and students up to the state of the art, while research brings them ahead of the state of the art, Madnick says.

Universities are eager to give their

students hands-on experience with state-of-the-art technologies. "We're always looking to bring the latest software into the classroom," says Jay Nunamaker, head of the department of management IS at the University of Arizona.

"We get students using software developed on research projects, so in the real world, they're even in front of industry," Nunamaker says. "We also bring in CASE tools like Accelerator and expert systems shells," he adds.

Learning is fundamental

However, providing students with this week's hot product isn't critical. "What's more important is that the students have enough exposure to different products so that they learn quickly and easily because of prior experience with learning. Their ability to learn is the most important thing today," Jordan says.

Some faculty members bring newspapers into the classroom to cover current IS issues. This tactic is a must when covering international IS developments, says Seymour E. Goodman, head of The Mosaic Group, an IS group with an international focus at the University of Arizona's department of MIS.

"Timely access to information relating to foreign research and development technology is difficult to come by, Goodman says. "We push *The Financial Times*, *The Economist* and the *Wall Street Journal*," he says. A new journal, *International Information Systems*, for which Goodman is editor, is trying to fill the information gap, he says.

Active IS faculty members are always looking for new avenues for university/industry interaction and welcome any opportunities the business world can offer.

"I would encourage companies to be proactive," McLean says. He suggests schools sponsor IS faculty members to work as interns. "The accounting profession has done this for years to let faculty members know what the big issues are in the accounting world," he says. *

AAAI-91

THE NATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE & INNOVATIVE APPLICATIONS OF ARTIFICIAL INTELLIGENCE CONFERENCE

JULY 14-19, 1991
ANAHEIM, CA

A unique combination brings together both academic and business communities in the year's leading AI forum... technical programs, tutorials, applications, interactive sessions, featured panels... plus exhibits demonstrated by leading suppliers of AI hardware, software and services.

American Association for Artificial Intelligence
945 Bingham Drive, Menlo Park, CA 94025
Phone 415-328-3121, fax 415-328-3122

IAAI-91

How students can ace IS test

How do schools ensure that their undergraduate and graduate students will make the transition from the classroom to the business community to relate their IS experience.

• Get input from corporate IS managers to help shape the school curriculum. This enables curriculum and degree requirements to match current business needs.

• Recruit IS managers to teach courses on applied technology.

• Offer courses on emerging technologies such as imaging, electronic data interchange, neural networks and so on.

• Encourage faculty members to consult and do research for businesses.

• Encourage or require IS students to do research on companies.

COMPUTER INDUSTRY

NATIONAL BRIEFS

They might be consultants

► NCR Corp. is not only about to be part of AT&T—it's about to be a consultancy, too. NCR's ACR—Advisory Consultant Relations—group will actually serve as consultants to consultants; according to a company spokeswoman, the group will develop and implement cooperative marketing programs for consultants, particularly those based in the U.S. and serving Fortune 500 firms. Under the direction of Michael Ruffolo, NCR's director of systems integrator alliances, the ACR group will afford users' advisers with a single point of contact in NCR's U.S. marketing organization and will enhance the company's already stated strategy of partnering with leading consultants.

Buy, buy

► El Segundo, Calif.-based systems integrator Computer Sciences Corp. (CSC) is poised to pay approximately \$22 million to acquire London-based information technology management consulting firm Butler Cox. The buy will significantly expand CSC's already substantial European presence, according to the firm. Software Publishing Corp. is also on a British shopping spree; the Mountain View, Calif.-based firm is about to buy Surrey, England-based database software maker Precision Software Ltd. for approximately \$25 million in cash and securities.

More briefs on page 118

Finding a place in the Rising Sun

BY CLINTON WILDER
OF STAFF

TOKYO — At the center of the often-known as U.S.-Japan trade relations is a soft-spoken man who for the past 11 years has helped prove that U.S. high-tech firms can succeed in Japan.

Edmund J. Reilly is president of Digital Equipment Corp. Japan, and this year he is also serving as head of the American Chamber of Commerce in Japan (ACCCJ). Founded just three years after Japan's surrender at the end of World War II, the

ACCCJ is a networking and advocacy group for U.S. companies in all industries doing business in Japan.

Reilly's thoughts on the current trade climate and prospects for U.S. computer firms in Japan include the following:

On the current competitive imbalance:

"I don't see the problem getting any better. There's a tendency to look at the trade issue as the overriding issue—Japan waited much too long to open their

Continued on page 116



Reilly hopes DEC Japan can be a model for others

Lotus files for summary judgment

Borland has one week to respond in copyright infringement case

ANALYSIS

BY PATRICIA KEEFE
OF STAFF

CAMBRIDGE, Mass. — Why wait? Lotus Development Corp. was supposed to meet in June with U.S. District Judge Robert Keeton and Borland International, Inc. attorneys to set a trial date for Lotus' copyright infringement suit against Borland. However, an impatient and confused Lotus jumped the gun two weeks ago by filing a motion with Keeton for a summary judgment in the case (CW, May 13).

Borland has another week to respond. The request for sum-

mery judgment does not address the issue of damages.

In March, Keeton rejected Lotus' request that discovery—the period during which evidence is gathered—be cut off and an early trial date be set. "We were looking to expedite the process," a Lotus spokesman said.

Borland claims that in March, Lotus asked the judge to decide the case "at an early date." Lotus based its request on the argument that the Borland case's outcome was controlled by the June 1990 decision handed down in Lotus' similar case against Paperback Software International, Inc. — a decision favorable to

Lotus. "All Lotus [did two weeks ago] is to reduce the same argument to writing," a Borland spokesman said. He said Lotus is really just trying to short-circuit the discovery process to "stop us from getting the information we need."

Lotus rebuts

Lotus general counsel Thomas Lemberg took issue with that interpretation. "In March, the judge was not asked to state his view on the merits of the case," he said. "We believe there are no factual disputes about whether Borland infringes on [our] 1-2-3 copyright," a Lotus spokesman said. There are two primary is-

suces in a copyright case, according to Lemberg.

The first is whether the material that Borland allegedly copied is copyrightable to begin with, which Lotus believes was established in the Paperback case.

The second is whether Borland copied those copyrightable elements. "They call it the 1-2-3 menu option," Lemberg noted. Lemberg further claimed that confidential parts of the Borland documents available only to Lotus' external legal team provide a strong case against Borland on intentional copying. "The judge will see from their own mouths, essentially, an admission of guilt," he said.

Conversely, Borland said it stands by its assertion that Quattro Pro is a unique product and does not infringe on 1-2-3's copyrights.

DATA/91: DECEMBER 10-12, 1991 MIAMI BEACH CONVENTION CENTER

Gateway To The Latin American And Florida Computer And Office Automation Markets.

DATA/91 is your gateway to the fast-growing Latin America and Florida technology markets.

In the last two years, this market for technology products more than doubled, to \$20 billion!

Meet the decision-makers, from industry, government and education, who have the budget and authority to buy your product. Decision-makers from: Brazil—the world's 8th

largest computer market, Mexico—where free trade agreements with the US promise a staggering increase in technology exports, Venezuela—an important high-tech importer, and many more countries, including Chile,

Argentina and Spain... and Miami, the center of Florida's dynamic high technology marketplace.

Make sure your company gets a share of the Latin American and Florida market.

Call Debra Andersen at 617-769-8950 to reserve your booth space today! The best locations are going fast!



Rising Sun

CONTINUED FROM PAGE 115

market and is still very slow to recognize problem areas.

"But even if the market were to open completely, there would still be a trade imbalance that's frightening. The Japanese companies have spent a tremendous amount of time and money to develop their products. The American companies have a tendency to give up too quickly."

On barriers to U.S. computer firms setting up operations in Japan:

"No matter how you look at it, it costs a lot of money to set up an office here. In Tokyo, the cost can easily be \$2 million,

which is very difficult for a \$30 million or \$40 million software company.

"The ACCJ has been working with the Japanese government to address [the problem] and provide incentives [for firms to make the move]. Teradyne Corp. recently opened an operation on the island of Kyushu. The Japanese government wants to decentralize and encourage business outside of Tokyo, so we hope it's a win-win situation. Software developers used to have to be close to the customers, but now we find development and design groups are much more able to be out in the countryside."

On market challenges in the computer industry in Japan:

"On the product side, in modifying a prod-

uct for the Japanese market — a lot of companies still don't do a good job in that area. The Japanese also have a very different concept of support [from that prevalent in the U.S.].

"Even in a completely open environment, many Japanese would be reluctant to buy American because they are used to different levels of support. They expect more in systems integration and total solutions. At DEC, customers want us to do a lot more than we did in the past. Japanese customers really demand that — but I think it's a business opportunity for U.S. companies."

On the Japanese high-technology labor market:

"It's very difficult to hire people, especial-

ly in software. Some estimates range as high as a shortage of 500,000 software developers in the mid-1990s. The ACCJ has put together some programs for recruiting Japanese university students to work for American companies."

On pitching U.S. firms as good employers:

"It has been hard in the past because the image of a U.S. company was that it would close after two years if it wasn't making money here. We've been using statistics to show that U.S. companies actually have a very good track record in employment. There have been very few layoffs, and it presents an opportunity [for Japanese people] to travel and learn another language. At DEC, we need many of the people we hire here back to the U.S. or to Europe."

"American companies do have the reputation of promoting people faster than Japanese companies and offer more incentives for fast-track employees. That can be attractive to ambitious people."

On recent changes in the Japanese labor market:

"A few years ago, very few people would consider ever leaving their company. Now, you do find more people willing to leave, about 7% a year."

"At the same time, it was difficult, if not impossible, [for American firms] to hire college graduates 10 to 15 years ago. As that has changed, it becomes a built-in feedback network from those employees back to undergraduates. We have also worked closely with some university professors — they play a strong role in influencing career choices."

On selling U.S. computer products to the Japanese government:

"The U.S. computer industry's share of the Japanese market in the private sector is about 25% and in the government sector is about 8% to 10%, which indicates there's a problem there. The market has only been open since 1985. At DEC, we've had less success in the government sector here than in any other country."

On Japanese investments in the U.S.:

"We're trying to bring down barriers here. The last thing we want is to put up barriers to investment in the U.S. We all should be encouraging investment in the U.S."

On the overall trade climate:

"In many respects, the market here has opened up. We had big trade barriers back in the 1970s with quota systems in place. Most of those official trade barriers have gone. There is nothing to prevent U.S. companies from doing R&D here or joint ventures."

"But there still are the unofficial trade barriers — the entrenched relationships of the *keiretsu* ["family of companies" concept], the more closed distribution systems, the financial barriers to set up here. By comparison with Japanese companies setting up in the U.S., it is much more difficult to come here. It will take a long time for them to change that."

Reilly, 49, has headed DEC Japan since 1980. He hopes DEC's experience can be a model for other U.S. companies. Although last year was a tough one for DEC overall, DEC Japan accounted for \$34 million of DEC's \$74.4 million of profits worldwide.

ANACOMP'S XFP 2000. LOCATED JUST SLIGHTLY BEYOND YOUR IMAGINATION.



If you think micrographics is outdated technology, think again. Today, it has been combined with the best in computer capabilities. The result is Anacom's DatagraphX XFP 2000™ and a wonderful storage niche we call "Wonder Fiche."

What You Put In Is What You Get Out.

The XFP 2000 is the only Computer Output Microfilm (COM) system that can deliver the latest in graphics technology. Our "Advanced Function Platform" duplicates a variety of fonts, forms, signatures and layouts for perfect reproductions of everything from invoices to bank statements.

The Flying Fiche.

Our patented continuous motion laser

imaging system produces fiche nearly twice as fast as any other micrographics system. It scans along at 30,000 lines per minute.

The XFP 2000 Not Only Connects With Any System, It Connects With The Future.

Our software-driven system is on the leading edge of micrographics, offering the capability to interface with technologies like magnetic and optical storage, scanners, local area networks and laser printers.

Wonder Fiche On Your Menu Not Only Makes You Smarter, It Helps Trim Fat.

The XFP 2000 reduces and organizes a 1,000 page report into four 4 x 6 inch Wonder Fiche. So, you can reduce storage space to a fraction. A savings that alone

could pay for the system.

And Wonder Fiche can make you an even smarter information manager. Anacom's exclusive Anafiche™ retrieval system lets you find a fact in a forest of information.

For more information write P. Lang Lowrey, Senior Vice President, Worldwide Marketing, Anacom, Inc., 3060 Peachtree Road, N.W., Suite 1700, Atlanta, Georgia 30305. Or call 404-262-2667.

THE IMAGE OF THE FUTURE
anacom

© 1991 Anacom, Inc. Anacom and Datagraph are registered trademarks of Anacom, Inc. Datagraph XFP 2000 and XFP 2000 are trademarks of Anacom, Inc.

EXECUTIVE CORNER

Northern Telecom hires Speakes

Northern Telecom Ltd.'s executive roster now includes former White House spokesman Larry M. Speakes, who early this month joined the Ottawa-based telecommunications player as communications vice president. Fresh from a stint as a communications consultant, Speakes served as assistant press secretary to presidents Nixon and Ford and was chief spokesman for President Reagan from 1981 until 1987.

As of last week, the president, chief executive officer and chairman he will report to is Northern Telecom's Paul G. Stern.

Maxtor Corp.'s search for a CEO came to an end last week with the selection of Laurence R. Hootnick to head the San Jose, Calif.-based disk-drive vendor. Hootnick, an 18-year Intel Corp. veteran, most recently served as president of that company's embedded controller and memory group.

His experience at Intel also included service as chief financial officer and as corporate senior vice president of sales and marketing. Maxtor founder James McCoy, who stepped in as interim CEO with the departure of George Sealine, will remain as chairman of the board.

Regis McKenna, founder and chairman of the international high-technology marketing consulting company Regis McKenna, Inc., has joined the board of directors at Oracle Corp. McKenna's hiring, according to Oracle's CEO, Lawrence Ellison, is one step in the company's effort to become a multibillion-dollar firm.

Peter S. Anderson has left New Valley Corp. (formerly Western Union Corp.) to take up the position of president and chief operating officer at Tustin, Calif.-based MAI Systems Corp. (formerly known as MAI Basic Four). Anderson succeeds a coincidental namesake, Fred D. Anderson Jr.

Peter Anderson, who started his ca-

reer at IBM, most recently served as president of the Western Union Priority Services unit and senior vice president of the parent company.

R. Stephen Chebey, a two-decade computer industry veteran with finance and operational experience in companies ranging from start-ups to giants at home and abroad, recently became senior vice president of finance and administration and CFO at Wellfleet Communications, Inc.

Chebey came to Wellfleet from a stint in consulting. Prior to that, he held an executive finance and administration post at Alliant Computer Systems Corp. and was involved in taking the company public.

HP, IBM refute dumping charges

BY CAROLINE GREEN
IDG NEWS SERVICE

LONDON — IBM and Hewlett-Packard Co. have lashed out at the makers of a UK documentary called *Fragile Earth*, which implies that the two firms dump hazardous waste in Taiwan.

The companies, which both claim to have a green philosophy, strongly denied the broadcast's implication that they bypass strict U.S. dumping laws and profit on waste disposed of in Taiwan.



Taiwan has extremely lax environmental laws, with consequent levels of pollution so high that a government report has predicted the country will be uninhabitable by the year

2000 if immediate action is not taken.

"A large part of this waste is computer scrap — crushed computers from companies like IBM and Hewlett-Packard," the documentary's narrator said on the program.

An IBM spokesman in the U.S. said the company was "greatly distressed" by the implications and added, "We have had words with the makers of that program. The implications are false."

The spokesman said the program's producers have avoided legal action because of the careful phrasing of the allegation and the use of the word *like* in the relevant sentence.

HP has issued an official response that states: "No hazardous waste from HP manufacturing sites is shipped overseas, neither directly nor through waste-disposal contractors. While HP does ship some scrap metal overseas, such shipments are the end result of an extensive recycling and disassembly program to reclaim old computers."

A spokesman for the television station said, "The material was checked through by our lawyers, and we stand by the program. Obviously [IBM and HP] can issue a complaint through the Broadcasting Complaints Authority if they feel they have been unfairly treated."

Green writes for PC Business World, an IDG Communications British publication.

...Windows & OS/2...
...clear view...

The Windows & OS/2 Conference is a truly independent conference and exposition focusing on the issues and applications surrounding these new graphical environments. Clearly, we're the logical choice for getting impartial information you can trust. Information that can give you and your company the competitive edge for years to come.

The Fall '91 Windows & OS/2 Conference will feature more than 60 in-depth conference sessions and tutorials, and 250 exhibitors showing the latest software and hardware products.

The Windows & OS/2 Conference is the only real-life, results oriented conference and exposition on graphical user interfaces for the PC.

Mark your calendar and plan now to attend the year's most important computer event.

Windows & OS/2
CONFERENCE

AUGUST 14-16, 1991
WORLD TRADE CENTER IN BOSTON, MASSACHUSETTS

For complete information on the conference and exposition, call or fax: CM Ventures, Phone: 415-801-6000 Fax: 415-801-6005
Or visit this unique Web site:

WINDOWS & OS/2 CONFERENCE
August 14-16 World Trade Center, Boston, MA
Visit Phone and Fax Numbers, Information on the Web
Or Contact us at: ☐ Exhibiting Opportunities

NATIONAL
BRIEFS

One bad Apple?

► The trend is more predictable than the weather these days. If disappointing quarterly earnings come, can stockholder suits be far behind? Not for Apple Computer, Inc., which early this month became yet another in a lengthening string of computer industry firms to be sued by shareholders claiming that the company issued misleading statements regarding its prospects. Apple immediately fired off a statement that it believes the lawsuit to be wholly without merit. The company said it will contend the suit.

From Tokyo with info

► The Tokyo-based Japan Management Association Research Institute, Inc. (JMAR), which claims to be the largest information research firm in Japan, is now open for business in San Diego — a first for JMAR, which has spent its 20-plus years offering its services on home turf. JMAR USA will provide information on Japanese markets, industries, firms, technologies and trends.

Amdahl takes a look at pricing to increase sales

BY JEAN S. BOZMAN
CIVIL ENGINEER

SUNNYSVALE, Calif. — In the wake of first-quarter earnings depressed by the U.S. economic downturn and even more immediately by a European sales slump, Amdahl Corp. is exploring new pricing strategies for its customers, according to President and Chief Operating Officer Joseph Zemke.

"We're obviously not satisfied with the financial results of the first quarter," Zemke told industry analysts at a briefing earlier this month. His \$2.1 billion firm earned \$11.4 million in the quarter ended March 31, down from \$29.9 million in the corresponding quarter one year ago. Revenue for the quarter was \$442.6 million, down from \$506.7 million.

A certain amount of creative financing — including extended payment plans, upgrade plans and bundled products — is helping Amdahl expand its customer base during the downturn, Zemke said. "There are fewer

fish in the pond," he said, referring to customers for multi-million-dollar IBM-compatible mainframes, "and they're being fished more heavily."

In the first quarter alone, Amdahl attracted 25 additional corporate clients representing 50 mainframe sites, Zemke said. The firm said it has an installed base of nearly 1,900 mainframe sites worldwide.

Amdahl Chief Financial Officer Edward Thompson said the firm is also controlling expenditures for the duration. Still, it has hired 300 people so far this year — somewhat fewer than planned — and is considering hiring 300 to 400 more by year's end.

The firm also spent 17% of revenue on research and development during the first quarter — high for any industry player — and used \$100 million in cash to build product inventories and finance machines for its leasing customers. In addition, it retooled its factories here and in Dublin.

"We'll be net users of cash in

the second and third quarters," Thompson said, "but we'll start generating cash again late in the fourth quarter." That is when Amdahl plans to ship a new entry aimed at competing with the high-end IBM Enterprise Systems/9000 models. The firm also plans to ship its new high-end Amdahl S390 disk-drive machines in the third quarter.



Amdahl's Zemke is looking to rectify a poor first quarter

Industry analysts quizzed the Amdahl executives about plans for future Unix-based file servers based on Scalable Processor Architecture (Spac) reduced instruction set computing technology, but no details of any future machine were given.

"We know how to build big machines, whether they're

based on emitter-coupled logic chips or whether we're using building blocks like the Spac architecture," Zemke said. "Our view of Spac is that it will provide a new level of price/performance in the open systems market."

While no mention of this was made at the analysts' briefing, Amdahl plans to gain increased software revenue through its new Huron Operations group. Huron, a mainframe-based software development system, was introduced March 26. It was promptly criticized by analysts as being too proprietary to play into any open-systems strategy. But Phil LeMay, vice president of Huron operations, noted that Huron is just as proprietary as IBM's AD/Cycle architecture — and produces applications that are completely IBM-compatible.

"It can become a very large business for us in a relatively short time," predicted John Pritchett, director of Amdahl's advanced market development group. Huron has been used by Amdahl's internal IS group for a year and is being installed at early support sites in seven U.S. cities. All Amdahl machines run IBM systems software, but Amdahl has been selling its own version of mainframe Unix, called UTS, for 10 years.

Computer companies stricken

European Community ponders treatment for ailing computer industry

BY BRYAN CRUMP
EDG NEWS SERVICE

LONDON — The European computer industry is sick. UK-based International Computers Ltd. may be with us today, but it could be Japan's Fujitsu Ltd. tomorrow. France's Groupe Bull needs bailing out, Netherlands-based NV Philips is restructuring, and Italy-based Ing. C. Olivetti & Co. S.p.A.'s directors must be wondering if they will ever see a black bank statement again.

The flagging fortunes of Europe's information technology standard bearers are clearly worrying European Community (EC) industry ministers. Earlier this month, they called on the EC to investigate why the sector is doing so badly. But not everyone is angst-ridden over the future of Europe's box makers.

"So what?" was one industry analyst's reaction to the proposed EC probe. "Should PCs be made in Europe? Not necessarily. There's more money in software. Maybe hardware manufacturers should be in the Far

East, while Europe concentrates on software," the analyst proposed.

Deals in demand

Ask many users whether European suppliers should be subsidized or protected with import controls — the current tariff for bringing semiconductors into the EC is 14.9% — and you are likely to find parochialism giving way to the consumer desire to score a good deal.

The views of one information technology manager working for a major money brokerage, who requested anonymity, are typical. "From the end-user point of view, I want the best deal kit at the best price. If you have protectionism, it's inevitable [that] prices are going to go up. Once you start putting up tariffs to protect companies, they are not going to have incentives to cut costs, and that's fatal in a fast-moving industry," he said.

Some industry observers share his doubts. Michael Skok, managing director of European Software Publishing, said, "Only efficient businesses should be

able to survive. That's what happens in the U.S., and that's why it has been so successful in creating things like Silicon Valley and the [Massachusetts Route 128 technology] corridor."

No entrepreneurs?

According to Skok, Europe's information technology woes revolve around its inability to create an environment in which entrepreneurial flair is encouraged. "In Germany, it's hard to attract people to start-up companies. In the UK, if someone's company fails, it's looked upon as a major stigma. In the U.S., having had a failed company is OK," he said.

Skok's views are not shared by Terry Pruce, managing director at Leicester, UK-based computer components firm Flint Distribution. Pruce said he still gets depressed when he has to buy products from Far Eastern rath-

er than European manufacturers.

For Pruce, tariffs are merely a way of getting the balance right. Because Asian companies do not have to pay their employees as much as their European rivals do and because they get the benefit of Western technology without all the hard research and development work, Pruce said he believes that the EC has the right to charge tariffs. Otherwise, he warned, EC companies may fall victim to that dreaded trade weapon,

the dump.

The EC is currently investigating allegations of floppy disk dumping by Chinese, Taiwanese and Japanese manufacturers (see story page 117). But the problem is that definitions of dumping and fair competition vary widely.

Barriers, pro and con

Nevertheless, Pruce may still have a point in saying countries such as South Korea have an unfair advantage in the trade stakes. "If we want to export to South Korea, I have to pay a tariff, which amounts to a 50% sur-

charge on the cost of the product," he said.

That is still no justification for import barriers, according to Skok. "Do you fight protectionism with protectionism? In my view, you don't. What we need is a world economy where there are no national boundaries for trade," he said.

Rob Briggs, chairman of Computer Users of Europe, disagreed. He said he believes the EC's role should be to foster the right environment for information technology industry growth. Right now, he said, it is failing miserably.

It is a question not so much of tariffs or subsidies but of making sure European companies stand on an equal footing with their U.S. and Asian rivals. "The EC seems prepared to produce within Europe a more vigorous legislative regime for [information technology] companies than anywhere else," Briggs said.

Even when the EC does move, Briggs said, it is tediously slow. If a perceived dumping threat crops up in the U.S. or Japan, the governments move quickly to deal with it, he said. Not so with the EC: It sets up a committee.

Crump writes for PC Business World, an IDG Communications British publication.



Europe

Two intelligence tools in the computer



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



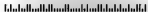
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



Ready to move into MANAGEMENT?

Systems & Computer Technology Corporation is a national leader in providing software & systems services to clients in local government and higher education. The following positions are available at various offices nationwide (including Philadelphia, Boston, San Diego, Cleveland and Washington, D.C.):

- Data Center Directors
- Operations Managers
- Systems & Program Managers

Qualified applicants will possess solid managerial and technical skills in an IBM, DEC, HP or NCR environment.

SCT offers competitive salaries commensurate with your experience. INTERESTED? Send resume (indicating salary history and willingness to relocate) to Recruitment Manager, SCT, 4 Country View Road, Malvern, PA 19355.



OLYMPIC CITY OPPORTUNITIES



run for the gold companies

Work for our clients, the FORTUNE 100 companies based in Atlanta. Golden opportunities are awaiting qualified Programmer Analysts, with an excellent package of benefits. Come qualify for permanent or contract positions in the following areas:

- IBM 4880 Controllers, BASIC, C
- IBM/VS, CICS, IMS, DB2
- AS 400, COBOL, SQL
- CASE Tools - ADW, REF, SYMON

SOFSYS INC.

an information & consultancy services firm
P O Box 871872, Marietta, GA 30067
(404) 319-8578

SOFTWARE ENGINEER: Design, develop, test, install and modify systems software for a variety of applications including: Accounting, Inventory, Manufacturing, and Communications. Requirements: BS degree in Computer Science, 2+ years experience in the job to be performed or one year experience as an Applications Programmer. Duties: to include completion of design, development, testing, installation, and maintenance of a database system. Education: to include completion of one course in each of the following: Database Systems, Computer Systems, Computer Architecture, and Computer Organization. Salary: \$25,000 - \$35,000 per year. Hours: 8:00 AM - 5:00 PM, Monday through Friday. Equal Opportunity Employer.

A terrific Opportunity

- Computer Consulting Director. See advertisement regarding our consulting services.
- Analysts with 2+ years experience. Excellent salary & benefits. No relocation necessary.
- IMS DB/DC
- DB-2/CICS
- C/UNIX
- INGRES
- RDB
- ORACLE
- FOCUS
- WANG

Computer Consulting Group

Contract Professional Services
Serving the Research Triangle Park and the Southeast area.
4410 West Forest Rd.
Suite 207
Raleigh, NC 27605
1-800-222-1273
FAX (919) 736-9123

CHICAGO AREA MULTIHOSPITAL SYSTEM DIRECTOR, INFO SYSTEMS

This visible Director must provide leadership, project management, and technical skills in...

- Turn around and stabilize IS operations and technical services.
- Support the implementation of new financial and clinical systems in IBM/DEC/Network environment.
- Expand IS services to ambulatory services.
- Rebuild a cohesive IS team.

The successful candidate will be self-motivated, have proven management skills, and a track record of similar accomplishments. For consideration, send your resume in confidence, to our consultants:

Mr. S. Ryan, Recruiter
Healthcare Management Consultants
235 Park Ave. South
New York, NY 10003

Base Processing

NOVELL LAN MANAGER/ ACCOUNTANT

Our downtown Chicago office seeks a highly organized, self-motivated, experienced LAN & Network support person. You will support Novell users, write database documentation, procedures & program manuals, troubleshoot hardware with recovery staff & support client base integrity.

Position requires min. 3 yrs. experience in application development & basic accounting skills. Knowledge of Lotus 5.0, Novell, ASP, A/P, P/P, RAG, & Data Base 4 preferred. Familiarity with PC hardware & knowledge of DOS & IP.

Excellent entry & benefits including tuition reimbursement & non-union office provided. Send resume & salary requirements to:

Dept. K&J&L
NOVELL
CHECKERS,
SMITH & ROBERT
One S. Wacker Dr.
Chicago, IL 60606
equal opportunity employer

EXPAND YOUR SKILLS GROW YOUR EARNINGS

Gilcor Enterprises, Inc., a national subcontractor to IBM, with offices in Chicago and Atlanta, has "hands-on" technical consulting projects in the Midwest and Southeast.

These assignments require a minimum of 3 years experience in one or more of the following areas:

- CASE: IBM/ADP, Beckman, Sycon, EASEL, Exelcom
- SYS. PROG.: MVS, DOS/VSE, VM, IMS, RCP/VJAM, DBC, CICS, AC/PTF
- P/A: 370/RAL, CSP, DAS, CICS, IMS, WAF, AS/400, FAF, COBOL, RPG II

Proffer candidates willing to travel. Please forward resumes with salary history to:

GILCOR ENTERPRISES, INC.
Attn: Mr. Pat McElhinney
3021 Midland Road, Suite 300
Oak Brook, IL 60451
Or Fax to 708-953-1463
Personal Only, NO C.O.D.



GILCOR ENTERPRISES, INC.



"...Our recruitment advertising in Computerworld has positioned us as America's leading CASE recruiting firm."

-Kurt Wilkinson
Vice President,
Advanced Technology Practice
Halbrecht & Company, Inc.

True to its motto, "Your Competitive Edge...Is People," Halbrecht & Company is well on its way to claiming top spot as America's leading CASE recruitment firm. With almost 20 years in the business and offices in Fairfax, VA, Old Greenwich, CT, and New York, NY, the firm provides national search and recruiting services on a contingency, and executive search basis. For Kurt "CASE" Wilkinson, Vice President, Advanced Technology Practice, recruitment advertising in *Computerworld* fulfills a two-fold purpose: generating quality resumes and maintaining its premier image among clients.

"Because of our expertise in leading-edge technologies, our clients look to us as management consultants rather than simply recruiters. So it's crucial that we focus on senior-level CASE tool and methodology professionals with strong I/S backgrounds. Our clients, including Fortune 500 companies, CASE tool vendors, and large consulting firms, typically have requirements for information engineers, senior consultants, data modelers, and I/S planners. Our recruitment advertising in *Computerworld* has positioned us as America's leading CASE recruiting firm.

"We consistently get up to 40 responses for every *Computerworld* recruitment advertisement we run. Since June 1988 we've placed over 70 I/S professionals in CASE positions, and a significant percentage have been direct placements from our *Computerworld* advertising. In fact, our statistics indicate that recruitment advertising in *Computerworld* attracts more qualified and placeable CASE candidates than any other source.

"In addition to generating resumes that

closely match job specifications, we also get other valuable benefits from our *Computerworld* recruitment advertising. For example, the advertisement we ran prior to attending CASE WORLD in Chicago opened new doors with contacts that I otherwise would not have made at the show. Also, on-going contacts we establish at companies, as well as referrals from vendors who recognize our name, help us secure future placements and even acquire new clients. Dollar for dollar, our national recruitment advertising in *Computerworld* is significantly more effective than classified advertising in local newspapers.

"Right now I believe we are strategically positioned to facilitate the hiring cycle for candidates and clients, whether they are vendors, consulting types or end-users. This market is still in its infancy, with the major growth period still ahead in the 90's. Our greatest challenge is maintaining a competitive edge. As we continue marketing long-term, Halbrecht & Company is dedicated to strengthening its market focus and positioning through its highly successful recruitment advertising program in *Computerworld*."

Computerworld. It's where serious employers - like Kurt Wilkinson - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell products and services for computers, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 in MA, 508/879-0700.

COMPUTERWORLD

Where the qualified candidates look. Every week.

COMPUTERWORLD
COMPUTER CAREERS

The hotel welcome mat is out

W

1 800 343-6474
IN MA 508 879-0700

BEST
READ

CEM

Fitbit

WHAT RECESSION?

We are an international consulting, systems integration and professional services firm looking for over 100 systems professionals in all of our major Midwest cities.

"Join us on today's technology that touches tomorrow." Contact us if you are experienced in:

CICS, DB/1
ORACLE
DB/2
LAN Development
Communications

Information Engineering
Documentation Specialist
Project Management
AS400
IMAGING

CTG values ability and is willing to reward it well. Call or fax your resume to any of our Midwest locations:

• CHICAGO: Jim McDonough
• CINCINNATI: Dave Schneider
• CLEVELAND: Faith Schiesche
• COLUMBUS: John Martelli
• DETROIT: Kim Row
• INDIANAPOLIS: Mark Hall
• LOUISVILLE: Bob Miller
• MERRILLVILLE: Ralph Villanuzzi
• MILWAUKEE: Jane Voss
• PITTSBURGH: Karen Browne

(312) 648-1084
(312) 753-6411
(216) 524-6441
(614) 288-8883
(313) 746-6090
(317) 573-2525
(317) 425-5688
(618) 738-1008
(414) 223-3777
(412) 323-9600

CTG

or send your resume:
Computer Task Group
8044 Montgomery Rd Suite 200
Cincinnati, OH 45236-2919
Attn: Linda Santieri
Equal Opportunity Employer.

a career that touches tomorrow

Automotive Design Systems Corporation Administrative Assistant to the Vice President of Engineering and Design. The position involves the coordination of engineering and design projects, including the preparation of reports, the management of project schedules, and the coordination of resources. The position also involves the preparation of proposals and the management of client relations. The position is located in the Detroit, Michigan area. For consideration, please send your resume to: Automotive Design Systems Corporation, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

TELECOM CONNECTION
We are seeking experienced professionals for the following positions:
• **TELECOM CONSULTANT**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to manage a team of technicians and coordinate with vendors.
• **TELECOM PROJECT MANAGER**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to manage a team of technicians and coordinate with vendors.
• **TELECOM DESIGNER**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to design and implement telecommunications systems.
For consideration, please send your resume to: Telecom Connection, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

Data Processing
IS PROFESSIONALS

Our clients are seeking experienced professionals for the following positions:
• **DATA PROCESSING SPECIALIST**: Must have 5+ years experience in data processing, including batch and online systems. Must be able to manage a team of technicians and coordinate with vendors.
• **DATA PROCESSING PROJECT MANAGER**: Must have 5+ years experience in data processing, including batch and online systems. Must be able to manage a team of technicians and coordinate with vendors.
• **DATA PROCESSING DESIGNER**: Must have 5+ years experience in data processing, including batch and online systems. Must be able to design and implement data processing systems.
For consideration, please send your resume to: Data Processing Professionals, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

We offer excellent compensation and benefits. Send your resume TODAY!

AMERICAN COMPUTER PROFESSIONALS
We are seeking experienced professionals for the following positions:
• **AMERICAN COMPUTER PROFESSIONAL**: Must have 5+ years experience in computer systems, including hardware, software, and networking. Must be able to manage a team of technicians and coordinate with vendors.
• **AMERICAN COMPUTER PROJECT MANAGER**: Must have 5+ years experience in computer systems, including hardware, software, and networking. Must be able to manage a team of technicians and coordinate with vendors.
• **AMERICAN COMPUTER DESIGNER**: Must have 5+ years experience in computer systems, including hardware, software, and networking. Must be able to design and implement computer systems.
For consideration, please send your resume to: American Computer Professionals, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

TELECOM DB2 & IMS & CICS
We are seeking experienced professionals for the following positions:
• **TELECOM DB2 & IMS & CICS**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to manage a team of technicians and coordinate with vendors.
• **TELECOM DB2 & IMS & CICS PROJECT MANAGER**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to manage a team of technicians and coordinate with vendors.
• **TELECOM DB2 & IMS & CICS DESIGNER**: Must have 5+ years experience in telecommunications, including voice, data, and video. Must be able to design and implement telecommunications systems.
For consideration, please send your resume to: Telecom DB2 & IMS & CICS, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

PROGRAMMER/ANALYST POSITIONS SYSTEMS PROGRAMMERS
We are seeking experienced professionals for the following positions:
• **PROGRAMMER/ANALYST POSITIONS**: Must have 5+ years experience in programming, including batch and online systems. Must be able to manage a team of technicians and coordinate with vendors.
• **SYSTEMS PROGRAMMERS**: Must have 5+ years experience in programming, including batch and online systems. Must be able to manage a team of technicians and coordinate with vendors.
For consideration, please send your resume to: Programmer/Analyst Positions, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

PROJECT ENGINEER Integration and implementation of new software systems into the manufacturing environment. Must have 5+ years experience in project engineering, including hardware, software, and networking. Must be able to manage a team of technicians and coordinate with vendors. For consideration, please send your resume to: Project Engineer, 10000 E. 15th Ave., Suite 200, Detroit, MI 48203. Equal Opportunity Employer.

USA in San Antonio. It's A Good Move For All The Right Reasons.

When you make the move to USA in charming San Antonio, Texas, you'll find easy commuting, big-city amenities and one of the lowest living costs in the country. It's a comfortable lifestyle that's great for families, and it's only one of the many things you'll find right with USAA. You'll also discover our people-first attitude, our commitments to breakthrough technologies and our 68-year dedication to quality of service. Qualify for one of our data processing positions, and you'll find that USAA is the right move, right now. United Services Automobile Association, an integrated family of companies providing insurance and financial products and services to officers of America's armed forces, offers superb work and recreation environments, a four-day week, innovative benefits and vigorous career development.

APPLICATIONS PROGRAMMERS

Minimum requirements include 2 years data processing experience in the following environment:

- COBOL II
- TSO/SPF
- IMS/MVS
- ALC

Experience should include working knowledge of programming, testing, commissioning and implementation phases of a large system. Exposure with on-line and batch application experience using IMS preferred. Experience with development methodology and the use of DB2 helpful.

MVS SYSTEMS PROGRAMMERS

Two years system programming experience with large scale IBM computing equipment running MVS/ESA. Two to three years experience planning, testing, and implementing system software products also required. Experience in the following environment:

- MVS/ESA
- Large multi-CPU IBM Local/remote location
- DFS
- JES2

Make the right move for all the right reasons! Qualified candidates should send a resume to:

USAA
USAA Building
San Antonio, Texas 78288-0055
Attn: Employment & Placement/SD/TLL/CW
An Equal Opportunity Employer, M/F



ONE COMPANY.

Keane employees enjoy what all technical professionals want. The stability of full-time consulting work. Some of the technologies including fourth-generation languages, database and productivity tools. The opportunity to apply their professional expertise at Fortune 1000 manufacturers, insurance companies, banks, service companies and government agencies. The chance to work for the premier project-oriented consulting company in the industry. Technical, management and project management training. Competitive salaries, comprehensive benefits, 401(k) plans, tuition reimbursement, and vacation accommodations. For one career offering endless possibilities, consult with Keane.

PROGRAMMER ANALYSTS PROJECT MANAGERS

We are looking for Data Processing Professionals who possess 2 plus years of experience in any of the following:

- AS400
- SYNON
- IDMS
- DB2
- ADABAS
- ORACLE
- UNIX/C
- TELECOM
- CICS
- CASE TOOLS
- LAN'S

For more information, call Lauren Wilkinson at 800-368-3363 or write your resume to her at Keane, Inc., 1801 Square, Dept. CW, Boston, MA 02129. An equal opportunity employer.

KEANE

ENDLESS POSSIBILITIES.

Connecticut
Delaware
Florida
Georgia
Illinois
Indiana
Maine
Massachusetts
Maryland
Minnesota
New Hampshire
New Jersey
New York
Ohio
Pennsylvania
Rhode Island



"...Typically 40+ percent of our total placements are a direct result of our Computerworld recruitment advertising."

*- Bob Shields
Owner & President
Robert Shields & Associates*

For over 10 years, Robert Shields & Associates has been specializing in the placement of computer software professionals both in the United States and overseas. The agency's day-to-day business centers around finding experienced candidates to meet the specific software needs of their clients. According to Owner and President Bob Shields, their regular advertising schedule in Computerworld plays an important role in their recruitment success.

"We serve a very broad market - from start-up companies to the Fortune 50 in virtually all industries. Because our client software requirements are extremely diverse, it's essential that we have access to a large pool of junior and senior-level software professionals with a great diversity in expertise. Computerworld is by far our single best source for reaching qualified computer professionals nationally.

"And to us, national reach is key. Although Robert Shields & Associates is based in Houston, Texas, our membership in National Personnel Associates puts us in direct contact with over 300 affiliate offices all across the country. Experience has shown us that only Computerworld delivers the computer market nationally. No other publication even comes close.

"Since we do work such a broad market, we sometimes advertise in specialty publications as well. With Computerworld, however, we consistently get more responses - and higher quality responses - than with any industry or discipline-specific publication. Because these candidates are much more likely to have the right kinds of experience, typically 40+ percent of our total placements are a direct result of our Computerworld recruitment advertising.

"Having been in the DP business since 1963 - and an avid reader of Computerworld from the very beginning, I've come to one conclusion: If you had to choose one publication that computer professionals read on a regular basis, it would have to be Computerworld. That makes Computerworld a very powerful recruitment advertising vehicle.

"During the 27 years I've been in the computer business, the demand for software professionals has consistently outstripped the supply. Every industry indicator suggests that this trend isn't about to change. As our client needs - and our needs - continue to grow, I see Computerworld continuing its role as our best source for reaching computer people on a national basis."

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Bob Shields. For all the facts on how Computerworld can put you in touch with qualified personnel, call John Corrigan, Vice-President, Classified Advertising, at 800/343-6474 in MA, 508/879-0700.

COMPUTERWORLD

Where the qualified candidates look. Every week.

1 800 343-6474
IN MA 508 879-0700



COMPUTERWORLD

COMPUTER CAREERS

The hotel welcome mat is out

T

W

IF YOU WANT TO TRAVEL

Ticket

Q&A

P

COMPUTER CAREERS

TPF Applications-Systems Communications

HYPERION W.W. & Associates has been providing top quality TPF consulting and contract services for years. And with offices in Amsterdam, Dallas, Singapore and London, our experience spans the globe.

We now have immediate openings for qualified professionals with expertise in large-scale TPF development projects. Applicants should be extremely quality conscious, reliable and professional.

Assignments are available to qualified applicants in a wide variety of locations.

Please fax or mail your resume to our Dallas office. Fax: 214-880-7712.

HYPERION W.W. & ASSOCIATES
Amsterdam • Dallas
London • Singapore

4004 Bellvue Road, Suite 150
Dallas, Texas 75244
9002 800-882-4073
Fax: 214-880-7712

HYPERION

INFORMATION SYSTEMS SPECIALIST

Programming Specialist - The successful candidate will be responsible for DEC software program development and maintenance, including expert system and/or artificial intelligence, graphics, statistics, database and general programming. Applicants must demonstrate high level of expertise with VAX/VMS and FORTRAN. A degree in Computer Science is preferred with SAS, PV-WAVE, OPSIS, LISP and/or ORACLE is desirable.

Applicants should send their resume to:

Illinois Department of Nuclear Safety
1015 Oscar Park Drive
Springfield, Illinois 62704
Attn: Mr. John Q. Ward (217) 783-9988

2001 is an Equal Opportunity Employer. Minorities and females are encouraged to apply.

Florida DON'T DREAM THE LIFE. LIVE THE DREAM!

Florida, with gentle winds bending the palms and an average temperature of 72° in one of the three places to live and work.

AMD Consulting Services is experiencing phenomenal growth. Our customers, Florida's premier information processing centers, have immediate needs for professionals with experience in any of the following:

- COROL, PU, ALC, RPO, TC, CCs
- POCUS, ORACLE, INFORMAS
- DBL SQL, IDMS, MUD, IMS
- TANDOL, COROL, SAT, PATHWAY
- DEC/VAX, UNIS, ALC, CCS, PCX
- COROL, MCCOMACKA & DODGE

It's your move, make it the RIGHT ONE.

AMD

One Hawthorne Place
Suite 800 • Fort Lauderdale, Florida 33304
(305) 471-2288

ATLANTA SOUTHEAST

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Atlanta, Georgia

Alcon Valley manufacturing operation has challenging opportunities in a State-of-the-Art shop for qualified candidates in the following positions:

DBA IMS/DB2

Must have IBM DB/DC database design and implementation performance tuning and monitoring. Will provide training and technical direction for development team. DB2 and ORACLE experience helpful.

PROGRAMMER ANALYST

4+ years of application programming experience in an IBM DB/DC environment. Strong COBOL and C/C++ experience. Must know system design methodology and have strong functional knowledge.

Please send or fax your resume to:

FMC CORPORATION, GSD
P.O. Box 58123
San Jose, CA 95158
(408) 288-8709

FMC
FMC Corporation is committed to a diversified workforce.

PROGRAMMERS

High Tech Environments

High Performance Business Systems

High Reward Lifestyles

PACBASE, TELONOR,

DISCIVOL, CISCIVAR,

DECVAX, SUN, UNICOL, ROBINS

Be A Part Of An Employer Owned Company

Call 1-800-553-0333

Florida, Atlanta & Hartford

Computer Management Systems, Inc.

1000 Bayview Rd., Jacksonville, FL 32209, Reg. C0971

The Down Breeding Company, Minnesota offers a rewarding career as a full time:

INFORMATION SYSTEMS SPECIALIST

Proven leadership abilities, systems design, project management and total information systems skills in all phases of the information system development life cycle (SDLC) methodologies.

This position must have and maintain a professional level of knowledge of computer systems and methodologies within the company. This position should have experience as a systems analyst, undergraduate degree in Computer Science, or MBA as preferred, with a minimum of 5 years of progressive work experience with a minimum of 100 hours of computer training. The successful candidate will be responsible for all information systems development, including systems analysis, design, programming, testing, and implementation. The successful candidate will be responsible for all information systems development, including systems analysis, design, programming, testing, and implementation. The successful candidate will be responsible for all information systems development, including systems analysis, design, programming, testing, and implementation.

For consideration, please submit your resume, with salary requirements to:

Down Breeding Company
Employment Services
P.O. Box 723200 • St. Paul, MN 55175-2320
Equal Opportunity Employer M/F/V/H

King Saud University, Computer Center

Data Processing Professionals required by King Saud University, Saudi Arabia

• VIM & MVS Sys Prog. • VTAM & NETVIEW Prog.

• Network Specialists N/W, S/W & LAN's

• Academic Support Programmer Analysts

• DBA (IMS & IDMS) • Operation S/N Loaders

Equipment: IBM 3084-3, 3080, 3085, 3086, 3087, 3088, 3089, 3090, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3101, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 3242, 3243, 3244, 3245, 3246, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3268, 3269, 3270, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482, 3483, 3484, 3485, 3486, 3487, 3488, 3489, 3490, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3500, 3501, 3502, 3503, 3504, 3505, 3506, 3507, 3508, 3509, 3510, 3511, 3512, 3513, 3514, 3515, 3516, 3517, 3518, 3519, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3528, 3529, 3530, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556, 3557, 3558, 3559, 3560, 3561, 3562, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3570, 3571, 3572, 3573, 3574, 3575, 3576, 3577, 3578, 3579, 3580, 3581, 3582, 3583, 3584, 3585, 3586, 3587, 3588, 3589, 3590, 3591, 3592, 3593, 3594, 3595, 3596, 3597, 3598, 3599, 3600, 3601, 3602, 3603, 3604, 3605, 3606, 3607, 3608, 3609, 3610, 3611, 3612, 3613, 3614, 3615, 3616, 3617, 3618, 3619, 3620, 3621, 3622, 3623, 3624, 3625, 3626, 3627, 3628, 3629, 3630, 3631, 3632, 3633, 3634, 3635, 3636, 3637, 3638, 3639, 3640, 3641, 3642, 3643, 3644, 3645, 3646, 3647, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668, 3669, 3670, 3671, 3672, 3673, 3674, 3675, 3676, 3677, 3678, 3679, 3680, 3681, 3682, 3683, 3684, 3685, 3686, 3687, 3688, 3689, 3690, 3691, 3692, 3693, 3694, 3695, 3696, 3697, 3698, 3699, 3700, 3701, 3702, 3703, 3704, 3705, 3706, 3707, 3708, 3709, 3710, 3711, 3712, 3713, 3714, 3715, 3716, 3717, 3718, 3719, 3720, 3721, 3722, 3723, 3724, 3725, 3726, 3727, 3728, 3729, 3730, 3731, 3732, 3733, 3734, 3735, 3736, 3737, 3738, 3739, 3740, 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3748, 3749, 3750, 3751, 3752, 3753, 3754, 3755, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3764, 3765, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3779, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 3787, 3788, 3789, 3790, 3791, 3792, 3793, 3794, 3795, 3796, 3797, 3798, 3799, 3800, 3801, 3802, 3803, 3804, 3805, 3806, 3807, 3808, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 3818, 3819, 3820, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 3840, 3841, 3842, 3843, 3844, 3845, 3846, 3847, 3848, 3849, 3850, 3851, 3852, 3853, 3854, 3855, 3856, 3857, 3858, 3859, 3860, 3861, 3862, 3863, 3864, 3865, 3866, 3867, 3868, 3869, 3870, 3871, 3872, 3873, 3874, 3875, 3876, 3877, 3878, 3879, 3880, 3881, 3882, 3883, 3884, 3885, 3886, 3887, 3888, 3889, 3890, 3891, 3892, 3893, 3894, 3895, 3896, 3897, 3898, 3899, 3900, 3901, 3902, 3903, 3904, 3905, 3906, 3907, 3908, 3909, 3910, 3911, 3912, 3913, 3914, 3915, 3916, 3917, 3918, 3919, 3920, 3921, 3922, 3923, 3924, 3925, 3926, 3927, 3928, 3929, 3930, 3931, 3932, 3933, 3934, 3935, 3936, 3937, 3938, 3939, 3940, 3941, 3942, 3943, 3944, 3945, 3946, 3947, 3948, 3949, 3950, 3951, 3952, 3953, 3954, 3955, 3956, 3957, 3958, 3959, 3960, 3961, 3962, 3963, 3964, 3965, 3966, 3967, 3968, 3969, 3970, 3971, 3972, 3973, 3974, 3975, 3976, 3977, 3978, 3979, 3980, 3981, 3982, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3994, 3995, 3996, 3997, 3998, 3999, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, 4014, 4015, 4016, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4032, 4033, 4034, 4035, 4036, 4037, 4038, 4039, 4040, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4049, 4050, 4051, 4052, 4053, 4054, 4055, 4056, 4057, 4058, 4059, 4060, 4061, 4062, 4063, 4064, 4065, 4066, 4067, 4068, 4069, 4070, 4071, 4072, 4073, 4074, 4075, 4076, 4077, 4078, 4079, 4080, 4081, 4082, 4083, 4084, 4085, 4086, 4087, 4088, 4089, 4090, 4091, 4092, 4093, 4094, 4095, 4096, 4097, 4098, 4099, 4100, 4101, 4102, 4103, 4104, 4105, 4106, 4107, 4108, 4109, 4110, 4111, 4112, 4113, 4114, 4115, 4116, 4117, 4118, 4119, 4120, 4121, 4122, 4123, 4124, 4125, 4126, 4127, 4128, 4129, 4130, 4131, 4132, 4133, 4134, 4135, 4136, 4137, 4138, 4139, 4140, 4141, 4142, 4143, 4144, 4145, 4146, 4147, 4148, 4149, 4150, 4151, 4152, 4153, 4154, 4155, 4156, 4157, 4158, 4159, 4160, 4161, 4162, 4163, 4164, 4165, 4166, 4167, 4168, 4169, 4170, 4171, 4172, 4173, 4174, 4175, 4176, 4177, 4178, 4179, 4180, 4181, 4182, 4183, 4184, 4185, 4186, 4187, 4188, 4189, 4190, 4191, 4192, 4193, 4194, 4195, 4196, 4197, 4198, 4199, 4200, 4201, 4202, 4203, 4204, 4205, 4206, 4207, 4208, 4209, 4210, 4211, 4212, 4213, 4214, 4215, 4216, 4217, 4218, 4219, 4220, 4221, 4222, 4223, 4224, 4225, 4226, 4227, 4228, 4229, 4230, 4231, 4232, 4233, 4234, 4235, 4236, 4237, 4238, 4239, 4240, 4241, 4242, 4243, 4244, 4245, 4246, 4247, 4248, 4249, 4250, 4251, 4252, 4253, 4254, 4255, 4256, 4257, 4258, 4259, 4260, 4261, 4262, 4263, 4264, 4265, 4266, 4267, 4268, 4269, 4270, 4271, 4272, 4273, 4274, 4275, 4276, 4277, 4278, 4279, 4280, 4281, 4282, 4283, 4284, 4285, 4286, 4287, 4288, 4289, 4290, 4291, 4292, 4293, 4294, 4295, 4296, 4297, 4298, 4299, 4300, 4301, 4302, 4303, 4304, 4305, 4306, 4307, 4308, 4309, 4310, 4311, 4312, 4313, 4314, 4315, 4316, 4317, 4318, 4319, 4320, 4321, 4322, 4323, 4324, 4325, 4326, 4327, 4328, 4329, 4330, 4331, 4332, 4333, 4334, 4335, 4336, 4337, 4338, 4339, 4340, 4341, 4342, 4343, 4344, 4345, 4346, 4347, 4348, 4349, 4350, 4351, 4352, 4353, 4354, 4355, 4356, 4357, 4358, 4359, 4360, 4361, 4362, 4363, 4364, 4365, 4366, 4367, 4368, 4369, 4370, 4371, 4372, 4373, 4374, 4375, 4376, 4377, 4378, 4379, 4380, 4381, 4382, 4383, 4384, 4385, 4386, 4387, 4388, 4389, 4390, 4391, 4392, 4393, 4394, 4395, 4396, 4397, 4398, 4399, 4400, 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4410, 4411, 4412, 4413, 4414, 4415, 4416, 4417, 4418, 4419, 4420, 4421, 4422, 4423, 4424, 4425, 4426, 4427, 4428, 4429, 4430, 4431, 4432, 4433, 4434, 4435, 4436, 4437, 4438, 4439, 4440, 4441, 4442, 4443, 4444, 4445, 4446, 4447, 4448, 4449, 4450, 4451, 4452, 4453, 4454, 4455, 4456, 4457, 4458, 4

Data Processing

Twentieth Century Companies, providing management and service to Twentieth Century Investors, a \$10 billion family of no-load mutual funds located in Kansas City, Missouri, is seeking analyst/programmers to join our expanding Information Systems department. Reporting to a programming manager, the responsibilities of these positions include the design, construction, testing and documentation of application systems.

Qualifications:

- College degree in information systems or computer science, or an equivalent combination of education and information systems experience.
- Demonstrated proficiency in the analysis, design, construction and implementation of fairly complex mainframe on-line and batch application program systems.
- Dyraton recordkeeping system experience.
- A minimum of two years of information systems experience which includes:
 - CICS Command Level programming
 - VSAM COBOL experience
 - Proficiency in use of TSO/ISPF
 - Programming in an OS/MVS environment
 - Proficiency in coding of MVS job control
- Other beneficial experience includes:
 - Database, preferably DB2
 - Cross System Product
- Demonstrated commitment to working as a member of a team.

We offer a competitive salary and benefits program within a progressive, results-oriented environment. If your background and experience match the requirements of this opportunity, please respond by June 10 with your resume and cover letter (including salary requirements) to:



Twentieth Century Companies, Inc. • Employment Specialist
P.O. Box 418210, Kansas City, MO 64141-8210

An Equal Opportunity Employer / A Drug-Screening Employer
No third-party inquiries, please.

Senior Software Engineer - Responsible for system software evaluation, development, optimization, design, implementation, testing & maintenance of a multi-processor, multi-OS environment. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

PROGRAMMER/ANALYSTS

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

OMNI Resources, Inc. is seeking experienced programmers and analysts for its clients in the financial services industry. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system. The position involves the design & development of a VAX/VMS operating system, and the implementation of a VAX/VMS operating system.

For more information
on our professional
services &
opportunities, contact
us by mail, fax or call:



The Computer
Merchant, Ltd.
BOSTON

CONSULTANTS

Announcing our
Newest Port of Call:
ATLANTA, GA

The Computer Merchant, Ltd. continues to meet the challenges of the technological marketplace. Seeking top-notch software professionals with business acumen across the United States. Since 1978, Fortune 500 firms have relied on The Computer Merchant to chart the course for software implementation solutions.

As demand for our services grows, the search for talented experts grows. Current opportunities for professionals with 3 or more years experience include:

CICS WINDOWS/PRIMS
VAX/VMS/MS-DOS
ULTRIX/SYSTEMS ADMINISTRATION
TANDEM/NONSTOP SQL
VS WORKS
C/CONTROLLING (PMS) I/O
C/VOLEX/NOVELL/MS-DOS

BAC77-5 CONVERSIONS
IBM-PC INITIAL
OFFICE VISION HA
UNREX LINK
NATURAL/CONSTRUCT
RABBIT DEVELOPMENT
PRIME 3 DEVELOPMENT

400 Pleasant Hill Road, Suite 300, Atlanta, GA 30307
(404) 275-0800 FAX: (404) 275-0160

100 Newport Center Dr., Suite 100, Newport News, VA 23606
(703) 778-6000 FAX: (703) 778-7779

CORPORATE HEADQUARTERS
80 Washington St., Building 5, Newark, NJ 07102
(609) 578-1070 FAX: (609) 578-4712

Computers

YOU CAN
HAVE IT ALL...
in Minneapolis

At AIC, DP professionals get the best of everything - the excitement of working challenging assignments, the security of a stable company, PLUS the security and stability of being part of Minnesota's leading software services company. A great combination that gives you the freedom to maximize your career potential.

We're seeking more great people with 1 plus years experience in ANY of the following areas:

IBM MAINFRAME
DEC/VAX
MICROSCAPE
ADAPTECH/INTEGRATED

As a member of the AIC team, you'll enjoy our current salary, paid vacation, medical benefits and the reputation for excellence that comes from being an industry leader. For further information call Carol Lee at (609) 275-0800 or send your resume to her at: American Information Corporation, Dept. CM-102, 7610 Woodloch Blvd., Minneapolis, MN 55426-3600. FAX (609) 888-4400.

AIC
A Reputation You
Can Be Proud Of
An Equal Opportunity
Employment Agency

THE JOB LINE
POSITION BROKER

Our staff serves OP, IC, and contract managers. We are currently seeking experienced professionals for the following positions:
• SYSTEMS ANALYST,
• SOFTWARE ENGINEER,
• PROJECT MANAGER,
• BUSINESS DEVELOPER,
• SALES REPRESENTATIVE,
• TRAINING MANAGER,
• QUALITY ASSURANCE,
• CUSTOMER SUPPORT,
• FINANCIAL ANALYST,
• HUMAN RESOURCES,
• LEGAL COUNSEL,
• PUBLIC RELATIONS,
• RESEARCH AND DEVELOPMENT,
• STRATEGIC PLANNING,
• TECHNOLOGICAL INNOVATION,
• VENDOR MANAGEMENT,
• WAREHOUSE MANAGEMENT,
• WORKFORCE MANAGEMENT,
• ZONE MANAGEMENT.

Our staff serves OP, IC, and contract managers. We are currently seeking experienced professionals for the following positions:
• SYSTEMS ANALYST,
• SOFTWARE ENGINEER,
• PROJECT MANAGER,
• BUSINESS DEVELOPER,
• SALES REPRESENTATIVE,
• TRAINING MANAGER,
• QUALITY ASSURANCE,
• CUSTOMER SUPPORT,
• FINANCIAL ANALYST,
• HUMAN RESOURCES,
• LEGAL COUNSEL,
• PUBLIC RELATIONS,
• RESEARCH AND DEVELOPMENT,
• STRATEGIC PLANNING,
• TECHNOLOGICAL INNOVATION,
• VENDOR MANAGEMENT,
• WAREHOUSE MANAGEMENT,
• WORKFORCE MANAGEMENT,
• ZONE MANAGEMENT.

Our staff serves OP, IC, and contract managers. We are currently seeking experienced professionals for the following positions:
• SYSTEMS ANALYST,
• SOFTWARE ENGINEER,
• PROJECT MANAGER,
• BUSINESS DEVELOPER,
• SALES REPRESENTATIVE,
• TRAINING MANAGER,
• QUALITY ASSURANCE,
• CUSTOMER SUPPORT,
• FINANCIAL ANALYST,
• HUMAN RESOURCES,
• LEGAL COUNSEL,
• PUBLIC RELATIONS,
• RESEARCH AND DEVELOPMENT,
• STRATEGIC PLANNING,
• TECHNOLOGICAL INNOVATION,
• VENDOR MANAGEMENT,
• WAREHOUSE MANAGEMENT,
• WORKFORCE MANAGEMENT,
• ZONE MANAGEMENT.

Our information systems professionals
help reduce expenses, improve
productivity, and enhance
customer service.

How's that for challenge?



With the help of SAFECO's information systems professionals, thousands of employees and agents keep the company rolling. From the computer keyboard, decade after decade, SAFECO continues to earn high marks for leadership within an industry that is wrapped up in automation. Today, we're continuing to venture into new territory, such as the use of advanced automation technology and expert systems. If you're ready to join a financial services leader, consider the following opportunities available at our Seattle Home Office location:

PC Consultant

We are seeking an analytical professional to conduct research into new technologies, evaluate products and become an expert in the areas of PC hardware and software. You will also consult with users to evaluate their automation needs, make recommendations, and provide support for implementation and training. A working knowledge of microcomputer technology and proficiency with DOS required. Strong leadership, organization, research, communication, and project management skills are essential. Knowledge of emulation products, local area networks, and IBM PCs preferred.

IMS Consultant

Your duties will be varied, and will include debugging, technical consulting, design support, and other independent projects related to improving the IMS environment. Excellent communication skills and a strong customer service orientation are essential to this position, as you will be working with all levels of users. Your superior technical skills, including an in-depth knowledge of IMS database functions, should be complemented by a sense of initiative.

We'll receive an outstanding compensation package and an environment conducive to professional growth. For prompt and confidential consideration, please send your resume and salary history to SAFECO Insurance Companies, SAFECO Plaza, Seattle, WA 98185. Attn: Karine Ledger, or call her at (206) 545-6142. You may also FAX your resume to (206) 545-6229. We will not accept salary history will not be considered. SAFECO is an equal opportunity employer.

Finding a better way in financial services.

SAFECO

MARKETPLACE

Exploring the uncharted gray market

BY KIMBERLY PATCH
SPECIAL WRITER

Gray market merchandise — new personal computers, miniframes and minicomputers sold through unauthorized reseller channels — holds enticing discounts of 40% and more for buyers intent on ferreting out low prices.

However, buyers should brace themselves for potential pitfalls. Obtaining proper product maintenance can be difficult and expensive, and inexperienced buyers risk acquiring used equipment despite promises of new products. Consequently, buyers should weigh three basic factors prior to navigating the gray market: dealer reputation, maintenance agreements and warranty and licensing papers.

Buying a computer on the gray market is not illegal, and neither the buyer nor the seller can be sued unless there is proof the equipment was stolen.

Dabbling in the gray market is really a buyer's beware, says John Dunkle, vice president of Workgroup Technologies, Inc., a market research firm in Hampton, N.H. "While the price may look very attractive initially, you're exposed if the system goes down," he says.

The first thing to do before buying in establish who will fix the computer if it breaks, Dunkle says. The buyer should also find out where he can have the machine serviced. Outlets that sell gray market PCs often do not service them, but some minicomputer and mainframe dealers do service machines and may even offer their own warranties.

Another factor is timing. Gray market dealers often receive large amounts of inventory that they want to unload quickly. If a buyer has to cut through all the red tape in getting a purchase order from his company, the machines may no longer be available when he is ready to buy.

Most gray market equipment comes from value-added resellers (VARs). When VARs sell less than projected, their suppliers usually don't take back the merchandise. To recoup their investments, VARs sell merchandise at a reduced cost to resellers. Dealers, who in turn sell the equipment to users.

Buyers can find gray market PCs at large retail outlets, mail-order houses and warehouse sales.

Although PC makers discourage meet leads, they tend to ignore gray market activity. For example, Fry Superstores in Sunnyvale, Calif., carries unautho-

ried PCs made by IBM, Apple Computer, Inc. and Toshiba America, Inc., but the vendors do not acknowledge the store as a channel, Dunkle says.

Buying by mail
Mail-order companies also sell gray market PCs. Damarq International, Inc., a mail-order firm in Minneapolis, sells mostly 1-year-old models and seconds.

"But there have been instances where we have purchased [new equipment] from a VAR" that was not authorized by the manufacturer to sell that equipment, says Mark Platt, a vice president at Damarq.

One-day computer flea markets, or warehouse sales, often contain gray market goods and savings. For example, Show Promotion, Inc. sponsors a one-day sale several times per year in the Boston area that includes authorized and unauthorized computers and peripherals.

Marvin Getman, president of Show Promotion, bought a Hewlett-Packard Co. Series II laser printer for \$1,100 at a recent show. "I know that it goes for more than that, so I thought it

was a good deal and bought it," he says. "The purchase came warranted, so I know I'm dealing with legitimate people."

Gray market parts also leak into the marketplace and let users buy merchandise cheaply.

Gerrit Krefetz, a financial consultant in New York, says he bought an Intel Corp. 80386-based PC clone with a 40M-byte hard drive, 1M byte of memory and two floppy drives for \$1,000. "I got a machine [worth] somewhere between \$1,700 and \$2,500," he says.

Krefetz says he bought the machine from a repairman who works for a major computer company and does a little business on the side assembling PCs from components —

some of which are probably gray market parts from the company he works for. "Major service companies throw out more parts than you can shake a stick at. I would not be surprised if service personnel help themselves to parts rejected for minor reasons," Krefetz says.

Gray market mainframes and minicomputers, on the other hand, are chiefly sold through used-equipment dealers.

Makers of larger machines tend to take a harder stance con-

cerning the gray market than do PC dealers. Several large equipment firms, including Digital Equipment Corp., have active programs to stamp out the activity.

Become midrange and miniframe dealers usually discourage customers from dealing in the gray market, buyers who purchase larger machines there tend to keep a low profile concerning those purchases.

One West Coast executive who is a Grid Systems Corp. and NEC Corp. VAR says his company recently bought a VAX 6210 from the gray market. "DEC wanted \$165,000 for it. We bought it through a large-system reseller for \$120,000. [The reseller] probably bought it for \$100,000. It came brand-new, directly from the factory."

Despite the overall tension on the part of vendors and uneasiness on the part of buyers, the gray market is not likely to disappear anytime soon, according to Dunkle and gray market users. It is simply a matter of economics.

According to numbers from Workgroup Technologies, the gray market makes up roughly 4% of all DEC VAX revenue and between 8% and 9% of IBM System/36 revenue. Given that IBM PC sales are "at least double" the gray market percentages for larger machines, Dunkle says.

Patch is a free-lance writer based in Boston.



Buy/Sell/Lease

IBM SPECIALISTS

AS/400 • SYS/3X

BUY • SELL • TRADE • LEASE

UPGRADES • FEATURES • PERIPHERALS

NEW AND USED

MAINTENANCE GUARANTEED

ON-SITE TECHNICIANS

IBM COMPATIBLES:

ASTRONOMER'S ASSOCIATES

2000 N. W. 10th Ave., Suite 100, Ft. Lauderdale, FL 33309



800-251-2670

540 BRYAN BL. • P.O. BOX 71 • OLD HICKORY, TN 37058 • PH (615) 847-4031 • FAX (615) 847-5729

IBM AS/400

Automated Backup

SIMPLE • INTEGRATED • UNATTENDED

Integrated AS/400 media management backup and restore with Magna's OZONE.

Menu-driven software in simple English (no extensive C/C++ knowledge needed)

Unattended, automatic backup

On-line data-base tracks

what, when and where to restore

Full media management and tracking

CALL FOR FREE 14-DAY DEMO

FOR QUALIFIED CUSTOMERS

Magna's OZONE Backup Software from:



Authorized Magna Office 1-800-223-9264

9370

Most Machines, Upgrades, Peripherals & Features in Stock

Now Supplying ES/9000-9221's

Call us for a quote 708-215-9370 Fax: 708-215-9992

Executive Information 1548 Barclay Hill, Buffalo Grove, IL 60089

9221

Series 1 to 25000 Migration Services

Series/1

RS/6000

SYS 36/38

AS/400

8370

4300

RT

Buy - Sell - Lease

813-943-0830

DATA TREND

2000 N. W. 10th Ave., Suite 100, Ft. Lauderdale, FL 33309

817-837-7255

801-750-7200

9221

BUYING SELLING

OLE, SUN, etc.

Price & Performance

CALL DE

817-837-7255

801-750-7200

9221

Time/Services

REMOTE COMPUTING

•We locate COMPUTER TIME-SHARING, including OUTSOURCING on ALL mainframes.

•Since 1986 we have found your LOWEST priced time over 800 reliable data centers.

•NEVER a charge to the Buyer, because our fee is paid by the Seller.

CALL JOHN BRONKH AT

COMPUTER

RESERVES, INC.

(201) 882-9700

CLASSIFIED MARKETPLACE

Where Computer Professionals Buy
(800) 343-6474
(in MA, 508/75-0750)

Software

KeyEntry III

REPLACE INCOMPATIBLE DATA ENTRY SYSTEMS
Fast, Easy Maintenance, All Functions

- LAM or stand-alone microcomputers
- Two-pass verification
- Batch indexing and check digits
- Operator statistics reporting
- Embedded numeric key-pad and auto edit
- Extensive field edits and table linkage
- Screen Printer and Manager/Printer interface
- Batch Control System and Relational utility
- User-definable help screens and windows
- Quick update
- Outstanding customer support
- Thousands of users worldwide
- French, Spanish, and German versions
- Consulting, conversion and integration services

800-533-5879

FREE
DEMO
AVAILABLE



SCS Software Corporation
1000 West 10th Street, Suite 100
St. Louis, MO 63103 • Phone 314-568-1000

Conversions

Data Conversion and Tape Duplication Specialists



This Interchange Services Company specializes in transferring data between incompatible computers, including:

- DEC VAX and PDP-11
- IBM-486, Type 800, Type 8000
- IBM-3090, Type 800, Type 8000

Tape Duplication services for:

- 9-Trail tape (1000 & 200000)
- DEC TC-48 and TC-79

Call for Details

DATA INTERCHANGE SERVICE COMPANY

3 Park Drive • Waltham, MA 01981 • (617) 622-8550

Bids/Proposals/Real Estate

It's the

Classified Marketplace

Reach Computer Professionals

Where They Shop For:

Hardware

Software

Peripherals/Supplies

Communications

Graphics/Printing

Time/Services

Bids/Proposals/Real Estate

Business Opportunity

Real Estate

Business Opportunity

Real Estate

Business Opportunity

Real Estate

Business Opportunity

Real Estate

SEE CENTRAL DATA PROCESSING AUTHORITY

Special programs will be released by CDP, 501 N. Lamar St., 301 Bldg., Suite 300, Jackson, MS 39201 for use between

SEP 2017, due Mon. 9/19/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2018, due Mon. 9/19/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2019, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2020, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2021, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2022, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2023, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

SEP 2024, due Tue. 9/11/91 at 3:30 p.m. for a Local Area Network for the Federal Bldg. & Transportation Dept. of the STATE DEPT. OF EDUCATION

The Genix Group

At The Genix Group, we provide mainframe computer outsourcing solutions to major international clients. With computer facilities that are among the finest in the country, your data is secure, yet readily available to you. Our high-quality, cost-effective services include:

- Computer operations 7 days a week, 24 hours a day
- Network Management
- Electronic Pricing

State-of-the-art IBM compatibility:

MVS/ESA • VM/XA • TSO/E

ROSCE • CICS • IMS

IDSMSR • DB2 • QMF • PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

PROFS

Programmer productivity aids:

FILE-AID • CICS PLAYBACK

• DBUG-AID • ABEND-AID

• CICS ABEND-AID

• (Processing products are registered trademarks of Computer Corporation.)

For more information, please call:

1-800-521-0444

5225 Auto Club Drive

Dearborn, Michigan 48126

REMOTE COMPUTING • OUTSOURCING

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

• MVS/ESA • CICS • VSE/STO

COST-EFFECTIVE COMPUTING SERVICES FOR TODAY and... TOMORROW

COMDISCO COMPUTING SERVICES CORP.

Provides you with:

REMOTE COMPUTING

COMPUTER OUTSOURCING

FACILITY MANAGEMENT

Featuring:

• IBM® C/PL and Peripherals

• Systems Software:

MVS/ESA, MVS/XA, TSO/E,

ISPF/PDF, CICS, VM/XA, VM/SP,

DOS/VSE, HPO, CMS

• Application Software:

Database Management

Application Development

4/GLs Graphics

Statistical Analysis

• Multiple Communications Methods

• Technical/Operations/Production Support

• Automated Tape Handling

• ULTRA-Secure Data Center

• Advanced Laser Printing

• Disaster Recovery Services

Call: Robert Martino

201-896-3011

COMDISCO

COMDISCO COMPUTING SERVICES CORP.

430 Goldwin Parkway, Carlisle, NJ 07072

OUTSOURCING • REMOTE COMPUTING

- IBM MVS/XA Environment
- DB2, IMS/RL, Model 304 and APL
- Professional Support Staff
- Experienced Migration Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
- Model Conversion
- Laser & Impact Print
- Full Facility Application Programming
- Technical Support
- 24 Hours a Day - 7 Days a Week

May & Speh, Inc.

1801 Olive Plaza, Des Moines, IA 50319-5713

(800) 728-1501

For More Information Contact: Tony Ringer

Guaranteed Service Reliability

Outsourcing • Remote Computing

Timesharing Options • Full MVS/ESA Services

CICS • ISPF • TSO • VSAM • VTAM

24 Hour / 7 Day Support • Disaster Recovery Services

Program Development & Trouble-Shooting



Call 515-224-8286

FINANCIAL INFORMATION TRUST

Providing Cost-Effective Solutions for Over 20 Years

MVS/ESA • DB2 • ADABAS • SAS • TSO • CICS • LIBRARY

Outsourcing & Computing Services

• Uninterrupted Service

• On-line Batch/FILE

• MVS/ESA & Impact Printing

• Media Conversion

908-685-3400

Committed to Excellence

in Quality Service and Customer Satisfaction

Financial Technologies

Innovative, Responsive, Quality

a few words that describe the most complete computer processor offering....

IBM 3090, MVS/XA, MSA, DB2, VM/HPO, TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

1-800-443-8797

14300 Sullyfield Circle
Chantilly, Virginia 22021

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

STATTAB

EDUCATION & TRAINING

Adding the missing piece in training

BY BYRON GLICK
SPECIAL TOCER

Many members of corporate America seem to view training as a kind of experience. Pick up a quick set of skills and head out the door. But adhering to four objectives—standardizing vocabulary, sharing expertise, reducing problems and increasing user satisfaction—can keep users browsing in the aisles and ending up with a cartload of benefits.

Objective No. 1: Standardizing vocabulary. Technical training is particularly susceptible to the Tower of Babel syndrome in which each person or group develops a private vocabulary that is not shared with others. Beginners invent terms that sound right but are not commonly understood, and experienced users double with jargon that is not intuitively obvious.

Trainers should break down the inherent barriers created by diverse vocabularies. Training builds a shared vocabulary that enhances intrasystem communication, streamlines problem resolu-

tion and reduces user learning curves.

Any experienced trainer will recognize that it is widely optimistic to expect a completely homogeneous vocabulary in a given system.

Still, training can be effective in the area of shared vocabulary by helping trainees identify diverse words, phrases and acronyms that designate similar objects or processes (and, worse yet, similar labels for diverse objects).

All training should be examined for its support of a common vocabulary or, in the absence of that, the identification of differences between vocabularies.

Objective No. 2: Sharing expertise. Despite the increasing presence of user groups, newsletters and network facilities such as electronic mail and bulletin boards, every company develops pockets of expertise that are not available to other users in its system.

In-house training is an opportunity to bring experienced users

into contact with newer users. While the more seasoned users may not be able to commit the time and resources to become trainers, they might be able to contribute case studies or other examples of specific application uses in a given work setting.

Additionally, if training is brought into the company, the experienced users can form a review board to examine course descriptions and training vendors. This review process will certainly help ensure better training selection and serve as a forum for discussing user needs and requirements.

Objective No. 3: Reducing problems. A more educated user base will report fewer trivial problems. Especially with the novice, nuisance errors can consume a great deal of time and energy on the part of the user and those who support the user. Many files have been lost because a user misunderstood default file storage locations. Since such errors are based mainly on a user's lack of

familiarity with a system or software package, proper training can reduce the number of problems reported and free up support resources by preventing problems in the first place.

In addition, if objectives 1 and 2 are realized, even significant problems will be easier to solve. A standardized vocabulary will yield clearer definitions of problems, and a wider base of expertise will provide a broader pool from which to draw solutions.

Objective No. 4: Increasing user satisfaction. User satisfaction is an often used and rarely defined term that lends itself to many methods of measurement.

One metric is user complaints. Every information systems trainer has encountered at least one frustrated user who is sure the system or application is broken when, in fact, some easily correctable user error is at fault. If this occurs frequently enough, the failure will almost always be blamed on the system and those who support it, not on those who use or misuse it. Training can familiarize users with the look and feel of an application and, consequently,

make them more successful and satisfied with that application or system.

A second index of user satisfaction is how a system meets previously unfulfilled needs. Training can raise this index by alerting the user to new functions and applying those functions.

PROPER TRAINING can reduce the number of problems caused by users' lack of familiarity with a system or software package, freeing support resources by preventing problems in the first place.

tions to the tasks the user already does.

New applications are most frequently used to perform the same function as the old application, only faster and easier. Good training will not only help the user apply new software to old tasks but will also highlight additional tasks to which the system might be applied.

Glick is an office systems coordinator in the systems administration division at the University of Wisconsin.



COMPUTERWORLD

Training Pages give you cost-effective reach!

That's because Computerworld's training Pages give you the most widespread reach available to management and staff in America's IS departments—the departments that directly control America's IS training dollars.

And for good reason Computerworld is the best read publication in America's IS departments—the departments that directly control nearly 80% of the \$233 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more Computerworld's Training Pages lead buyers to your ad with a weekly Training editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling SQL for MIS pros," or "Finessing the training contract," Computerworld's Training Pages deliver pertinent, advice-oriented editorial to Computerworld's readers every week.

COMPUTERWORLD

Where training decision makers meet training vendors. Every week.



1991 INTERNATIONAL JAD/CASE CONFERENCE



Retaining I.S. for Quality NOW:
The JAD/CASE Mobilization

ATLAS Performance Resources, Inc.
31st Annual METRIC Users Conference

Executive Sponsor:

Brig. General J. Ronald Carey
Program Manager
Business Computer Automation System
United States Army

Conference Topics Include:

- JAD
- Prototyping with JAD
- Executive Perspectives
- Data Modeling
- JAD/Fusion: Getting
- JAD and CASE Together

Location:
Washington Marriott Hotel
1201 23rd Street, NW
Washington, D.C.

To Register Call:
202-778-3888

Computerworld's Training Pages...

gives you the opportunity to reach over 629,000 potential attendees for your seminar/conference! For more information, call:

800/343-6474
In MA, 508/575-8700



INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM HOLD TO SELL: Apple Computer, Inc. (Bear Stearns & Co.) Reason: New product sales in question after some dealers and vendors indicated that supply is catching up with larger demand. Budget constraints, especially among school systems where Apple machines are popular, make Apple a dicey stock.

DOWNGRADED FROM BUY TO HOLD: Conner Peripherals, Inc. (Bear Stearns). Reason: Slower sales predicted for Apple and other OEMs with contracts for Conner disk drives may offset the firm's momentum in the market for notebook computer drives.

DOWNGRADED FROM AVOID TO SELL: Sequent Computer Systems, Inc. (Bear Stearns). Reason: Weak economy and seasonal order fluctuation are intensifying Sequent's troubles, which include a rocky transition from Intel Corp.-based 80386 machines to 14686 products.

DOWNGRADED FROM BUY TO HOLD: Silicon Graphics, Inc. (Bear Stearns). Reason: IBM's recent price cuts on its RISC System/6000 workstation line will pressure workstation makers to respond; Silicon Graphics stock is vulnerable to such short-term events.

UPGRADED FROM BUY TO STRONG BUY: IBM (Bear Stearns). Reason: Despite its weak first-quarter earnings, IBM is not just much market share. Most major mainframe companies showed similar results, and growth among the personal computer firms was also less than expected. Sales took good for the host of new products recently introduced.

UPGRADED FROM NEUTRAL TO ATTRACTIVE: Sun Microsystems, Inc. (Paine Webber, Inc.) Reason: Investor concern over new consortium led by Compaq Computer Corp. helped push Sun stock down recently. However, Sun can deliver products now, while the consortium will not deliver for at least one or two years.

GUEST SPEAKER

Marly Reisinger, technology analyst, Duff & Phelps Investment Research Co., Chicago

"By rating IBM a long-term hold, we're trying to signal investors to think of IBM differently."

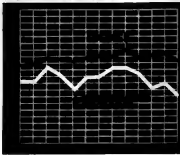
"No longer can you buy IBM and put it away as a core holding. It can't be unthinkingly counted on for long-term appreciation [because] it certainly hasn't grown all that much in terms of earnings per share since 1984."

"The strong currents in the industry toward smaller and more standard computer systems have impacted IBM's earnings — and we're not even halfway there in terms of seeing a full outcome of these trends."

"IBM may not be doing itself a favor over the long haul by being in the software business. Its large presence can discourage people from developing software for IBM platforms if they know they have to sell against IBM or IBM-backed developers. The success of IBM hardware depends on there being software available for it. If IBM competes with smaller software developers and knocks them right out of the business, [IBM] won't, ultimately, build its business."

KIM S. NASH

STOCK TRADING INDEX



Computerworld Friday Stock Ticker

COMPOSITE INDEX: FRIDAY, MAY 17, 1991

TOP PERCENT GAINERS

Advanced Micro Devices	21.65
Advanced Technology Systems	17.10
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28

TOP PERCENT LOSERS

Advanced Micro Devices	-1.88
Advanced Technology Systems	-1.78
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28

TOP DOLLAR GAINERS

Advanced Micro Devices	1.88
Advanced Technology Systems	1.78
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28
Compaq Computer Corp.	1.28

TOP DOLLAR LOSERS

Advanced Micro Devices	-1.88
Advanced Technology Systems	-1.78
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28
Compaq Computer Corp.	-1.28

Communications and Network Services

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Computer Systems

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Software & DP Services

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

THIS WEEK'S HIGHLIGHTS

- After saying second-quarter profits will take an 80% swoon dive, Compaq Computer Corp. fell 15 1/4 points last week, losing nearly 30% to close Thursday at \$54.
- Other large technology stocks were also battered. IBM fell 1 1/4 points to 104 1/4, Digital Equipment Corp. dropped 2 points to 64 1/4, and Hewlett-Packard Co. slipped 1 point to 48.
- Among networking firms, Cisco Systems, Inc. rose 2 1/4 points to 29 after reporting revenue and profit increases for the current quarter. Cabletron Systems, Inc. also tumbled, losing 5 1/4 points to close at \$30 1/4.
- Some software makers lost big, including Borland International, Inc., which suffered a 9 1/2-point fall to \$44 1/2, and Microsoft Corp., which suffered 6 1/2 points to 99 1/2.
- As NCR Corp. and AT&T started working to become one, investors pushed both stocks back half a point last week. NCR closed at 102 1/2 while AT&T ended Thursday at 36 1/4.

STOCK TRADING INDEX

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Semiconductors

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Peripherals & Subsystems

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Leasing Companies

CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00
CompuLink	1.00

Copyright Hewlett-Packard Co., 1991. All rights reserved. This information is provided for informational purposes only. It is not intended to be used as a basis for investment decisions. The information is subject to change without notice.

NEWS SHORTS

Federal IS costs to hit \$27 billion

The National Aeronautics and Space Administration and the U.S. Departments of Treasury and Transportation will undertake the Army, Navy and Air Force as the three largest spenders for information systems by 1996, the Electronic Industries Association (EIA) said in its third annual five-year forecast of federal IS expenditures. All total, Uncle Sam will spend \$27 billion for IS in 1996. The EIA predicted a 3% annual real decline in defense IS spending and an increase at civilian agencies.

DG wins contract defense

The U.S. Supreme Court let stand a Federal Appeals Court ruling in favor of a \$127 million contract awarded to Data General Corp. by the U.S. Department of the Interior. The contract had been contested by SMS Data Product Group, Inc. in Reston, Va., on the basis that the award had been biased in DG's favor by Washington, D.C., insiders.

3Com OSI software ships

3Com Corp. announced shipment last week of its personal computer-based Open System Interconnect (OSI) software ahead of schedule. The Santa Clara, Calif.-based company had said it would ship OSI/ES next month with demand-prioritized architecture and OSI/ES Interconnect. 3Com said the software is the first to support OSI's Virtual Terminal Protocol and File Transfer Access Management on DOS PCs.

Link settles lawsuit

Present, Calif.-based terminal vendor Link Technology, Inc. has reached an out-of-court settlement of its yearlong legal dispute with neighbor and competitor Intel Technology, Inc. Last summer, acting on the belief that Intel's then newly announced Sherwood terminal line had been developed using Link technology supplied by four recently departed Link executives, Link filed suit against Intel and its parent, Intel (USA) Corp. Last week, both parties apparently decided to get out of court and back to business. Neither party alleged that the other side's claim lacked merit. Neither conceded fault. Both agreed to forego further litigation in favor of a settlement agreement.

Software AG adds tool kit

Software AG of North America, Inc. last week unveiled a software development tool kit that combines existing products with services. The Rapid Application Development program tools run on IBM mainframes and consist of Natural, a fourth-generation language; Predict, a repository; Natural Architect, which specifies requirements; and Predict Gateway, a migration tool to gather information from other vendors' computer-aided software engineering tools. The total package costs between \$45,000 and \$400,000, depending on the processor. Some training is included. Customization is priced separately.

Intel recasts organization

Intel Corp. announced several organizational changes recently, including the creation of three new groups that will report to Intel's executive office. The groups — Architecture and Applications, headed by Senior Vice President David House; Software Technology, led by Vice President Ron Whittington; and Mainframe and Supercomputing Components, headed by Vice President Ken Pike — are intended to "address major market opportunities for Intel," said President and Chief Executive Officer Andrew S. Grove. With the creation of the new groups, Intel's Microcomputer Components Group will be dissolved.

Lynch takes new Unisys post

Unisys Corp. last week appointed Hugh T. Lynch president of its Computer Systems Product Group. Lynch, a former NCR Corp. executive who came to Unisys six months ago, fills the slot vacated by Cyril Yamsouli, who left the \$10 billion computer and defense company late last year. Lynch will be responsible for Unisys product development, engineering and manufacturing operations worldwide.

Stardent unveils desktop gear

BY SALLY CUSACK
OF STAFF

CONCORD, Mass. — Stardent Computer, Inc. broke new ground last week by introducing a family of desktop visualization systems that are based on a 40-MHz Intel Corp. 8680 processor and are aimed at the scientific and research communities.

Dubbed the Vistra 800 series, the reduced instruction set computing (RISC)-based product line runs under the AT&T Unix V Release 4 operating system.

Stardent will still actively market and support its Titan line of Mips Computer Systems, Inc. R6000-based workstations for advanced graphics applications.

Seeing the niche

The visualization industry targets a niche market of leading-edge scientists who require a platform for computational chemistry and similarly com-

pute-intensive applications, said Charles T. Casale, president of Aberdeen Group, a Cambridge, Mass.-based consulting firm.

The Vistra 800 series offers three models with differing rendering levels of graphics performance. They range from 33,000

THE VISTRA 800 series is a family of visualization systems aimed at the scientific and research communities.

polygons and 260,000 three-dimensional vectors per second at the low end to 90,000 polygons and 500,000 3-D vectors per second in 24-bit color at the high end.

All models support Stardent's A/VIS visualization software and

provide Virtual Pixel Map support. This allows the user to implement double buffering and enhanced pixel attributes without purchasing additional pixel memory.

The platforms integrate a 3½-in., 1.44M-byte floppy disk and a 3½-in. disk drive capable of storing either 200M or 400M bytes of data. A small computer systems interface is also provided, and the systems can be configured with 16M to 64M bytes of single-line memory module memory.

Casale indicated that the IBM RISC System/6000, the Silicon Graphics, Inc. workstation and the recently announced 700 series from Hewlett-Packard Co. will still dominate the general-purpose advanced workstation market.

Pricing for the 800 series ranges from \$20,995 to \$59,015, and volume shipments are slated to begin next month.

Doubt lingers on NCR 3600

Acquisition effects cited as reason for concern

BY MICHAEL FITZGERALD
OF STAFF

NEW YORK — The technology may be impressive, but potential buyers have their doubts about buying into NCR Corp.'s new System 3600 because of the possible side effects of NCR's acquisition by AT&T.

NCR rolled out the System 3600 parallel processing system last week in a presentation to

communications/LAN support at Citibank.

"I think they have a very good strategy," said Salvatore F. Chiaramonte, Citibank's vice president of International Standards Organization administration. "We're going to adopt a wait-and-see attitude; the question in our minds is, will AT&T be hands-off or not?"

Charles E. Ealey Jr., NCR's chairman and chief executive officer, said NCR believes the 3600 will find a solid market. Analysts said companies with huge databases would be best for 3600-type mainframes.

The System 3600, a member of NCR's System 3000 family, was designed to run up to 288 loosely coupled Intel Corp. i486 chips. It runs AT&T Unix System V Release 4, so it supports software such as Oracle Corp.'s Oracle and Informix, Inc.'s Informix relational database management systems, NCR said.

David Card, an analyst at International Data Corp., suggested several uses for the machine. "Take a credit-card processing company that wanted to do direct mailing to [a specific market]. That's the whole thing is incredibly good at doing. Or in a retail environment, if you want to compare in near real time data gathered from all your stores."

NCR will begin beta testing the 3600 in September and is slated to start shipping in the fourth quarter. Prices range from \$855,000 to \$5 million.

Ealey said NCR expects to ship 10 or 12 of the machines by year's end.

WE'RE GOING TO adopt a wait-and-see attitude; the question in our minds is, will AT&T be hands-off or not?"

SALVATORE F.
CHIARAMONTE
CITIBANK

120 potential buyers, including representatives of American Express Co., Citibank/Citicorp and the Federal Reserve System.

Some users said they were favorably impressed, although most expressed concern about the merger. The newness of NCR's strategy of placing microprocessors in a massively parallel architecture to generate up to 10 million instructions per second (MIPS) was also a concern for users.

"We're very interested in its price/performance," said Skip Peterson, vice president of tele-

DEC files licensing lawsuit

BY MARYFRAN JOHNSON
OF STAFF

MAYNARD, Mass. — Digital Equipment Corp. filed a lawsuit last week against Clearpoint Research Corp. over the disk and tape storage subsystems Clearpoint began selling in 1990 for DEC's VAX-6000 and 8000 computers.

At issue in Clearpoint's refusal to pay licensing fees to DEC for Clearpoint's DCMS-DSB disk and DCMS-TSB tape storage controllers, which attach directly to the VAXBI bus on high-end VAXs.

DEC maintains that the third-party vendor is infringing on five of its patents on the VAXBI bus and has patented the three-stage Cache Protocol. Both products are openly licensed now to about 25 of Clearpoint's competitors.

"We spent \$1.5 million developing this alternative technology back before DEC was licensing the VAXBI bus," said Vince Bono, founder and president of Clearpoint. "We genuinely believe we don't need a license."

Bono emphasized that the lawsuit will remain "transparent" to his 2,500 customers worldwide. The disk and tape lines have so far sold approximately 1,000 units, he added.

If DEC prevails, Clearpoint will have to pay \$1,400 in licensing fees per subsystem.

IBM

FROM PAGE 1

[Harold] Greene will let them do certain things," Ciesewski said. "It's a lot better when you don't have to worry about those constraints."

Former IBM market research analyst John Torres, who left IBM last year to become vice president at research firm Lodgeway/Dataseq in Lexington, Mass., said the move should make IBM's outsourcing business more flexible and entrepreneurial.

"There were many times [at IBM] when we wanted to do something to make us more competitive, but we didn't because of the Consent Decree," Torres said.

The 35-year-old Consent Decree is murky when applied to today's outsourcing business. It prohibited IBM from competing directly in what was then known

Integrated Systems Solutions Corp.

- **Headquarters:** Tarrytown, N.Y.
- **Employees:** 5,000
- **1990 revenues:** \$800 million*
- **Current contracts:** 1,300 (five outsourcing "megaprojects"; all others for disaster recovery, data center relocations and various other services)
- **President and chief executive officer:** Donnie M. Walsh, former head of IBM Systems Services Division
- **Chairman:** Bernard Puckett, general manager of applications solutions

*Excludes IBM's Tivoli Group

CW Chart: Downes Jr., John

as the service bureau business, which the agreement defined as "the preparation of information and reports for others on a fee basis."

One competitor, Dallas-based Affiliated Computer Services, Inc., has complained loudly in recent months that IBM's contracts with Kodak and other customers violated the decree.

Although the Justice Department had taken no action on the software and services industry trade group Adapco formed a committee to investigate the allegations.

That committee was scheduled to meet late last week to determine whether to disband. "It's not as relevant as it was two weeks ago," Adapco Vice

President Bill Warner said. Arlington, Va.-based Adapco issued a press release applauding IBM's move.

"Washing its hands"
Affiliated Computer Services Chairman Darwin Deason, however, remained adamant, charging that IBM merely "washed its hands" of the alleged violations.

"I'm outraged," Deason said. "What about the fact that they built this whole revenue stream illegally? It's like breaking into my house and stealing my possessions, then moving them into another house and saying you'll pay the taxes on them. That doesn't make it right."

A spokesman for Electronic Data Systems Corp. — IBM's largest competitor in outsourcing — declined to comment on IBM's action.

ISSC will also provide IS support for all of IBM's internal field organizations in the U.S. The combined outsourcing and inter-

nal business could total \$1 billion this year, according to The Yankee Group.

Out and about

Outsourcing was estimated at a \$4.4 billion market in 1990, with a projected overall growth rate of 15%.

Percent of 1990 worldwide revenue of U.S.-based vendors



Total outsourcing \$4,377B

Source: International Data Corp. CW Chart: Martin Steiner

Budget cuts, slow news keep some from Comdex

BY CW STAFF

Economic restrictions and the slow pace that trade shows must not deliver much news coverage will keep a number of microcomputer managers away from Comdex/Spring '91, according to several managers interviewed last week.

However, the addition of Windows World, which will run in conjunction with Comdex/Spring '91 and falls on the first anniversary of Microsoft Corp.'s Windows 3.0, has succeeded in bringing back some key vendors, such as Lotus Development Corp. It may also be behind a 20% jump in preregistrations over last year, with Interface Group, the sponsor, predicting a turnout of 60,000.

Arthur Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco, for example, is making a "massive" move to Windows.

Having settled on his core products, Beckman is sending two people to scout out new

packages at Windows World. However, several of those interviewed were reluctant in saying they would travel budget to Comdex, which is moving to late June.

"I think PC Expo is starting to take [interest] away from Spring/Comdex," said Jacqueline Byraddock, a personal computer coordinator at Jockey International, Inc. in Kenosha, Wis. She is going to Comdex/Spring, but she said it may be her last time.

"If I were to go to a show at this time of year, I would go to PC Expo," said Bob Holmes, a systems consultant at Southern California Gas & Electric Co. in Los Angeles. "There are notable absences at Comdex. IBM being one, that will be at PC Expo."

Other users, such as Black & Decker Corp.'s Greg Faries, manager of client information services in the firm's Towson, Md. office, and Carl W. Barn, technical support manager at Millstone Coffee, Inc. in Everett, Wash., said economic conditions have curtailed travel.

"The first thing companies

cut are people, salaries and travel. I'm not sure management views some of these shows to be as beneficial [for] the cost," said Faries, noting that his company will not send anyone to the show.

Barn echoed a couple of users when he said he has attended Comdex/Spring in past years with a set agenda, but he does not have anything to look for this year. "We probably aren't going."

No one in Accentra's Computer Interior Systems, Inc. in Occidente, Calif., is going, according to MIS manager Harry Vanderbyl, who said it is not worth fly-

ing out to Atlanta just to battle the throngs.

Those who are going appear to be predominantly interested in Windows applications and development tools and front ends for Microsoft's SQL Server. The latter is particularly compelling.

Ron Adinolfi, a vice president at Swiss Bank Corp., said he needs a development package that will allow him to write a front end to SQL Server and IBM's Database Manager as well as generate a finished product for either OS/2 or Windows. No such tool surfaced at last month's Microsoft Tools Con-

ference, and Adinolfi said he is not willing to build it himself. "[To do so] is probably more work than the benefit you'd get out of it." Meanwhile, his database project is stalled.

One of the expected high-lights at the show is a wave of high-end notebook and laptop introductions.

Sheldon Laube, national director of information and technology at Price Waterhouse, is looking at multimedia. "It's a breakthrough product because it will open computers up to people who've never used them before," he said.

Will Zenith's PC line put it back on the map?

BY MICHAEL FITZGERALD
CW STAFF

ATLANTA — Zenith Data Systems will announce a suite of personal computer products at Comdex this week, including a notebook computer based on Intel Corp.'s 80386SL power management chip. Analysts were divided last week on whether the new products would be enough to remedy what they called Zenith Data's lack of presence in the market.

The SL notebook may be the

key to the Groupe Bull subsidiary climbing back into the PC hierarchy. The \$4,999 Masterport 386SL features 6.8 pounds, has a full-size keyboard, a 60M-byte hard drive, 2M bytes of random-access memory (expandable to 8M bytes) and sophisticated power management features that give it up to 10-hour battery life.

Zenith Data will also introduce notebooks based on Intel's 80286 and 80386SX notebooks, two battery-powered portables based on the 1486 and 1486SX and two desktop file servers centered on Intel's two 1486 chips.

"This is absolutely a hot-company announcement," said William Abbondi, an analyst at BIS Strategic Decisions. Abbondi added he thought Zenith Data was in its gamble. However, G.D. Hodge, head of Booz, Allen & Hamilton, Inc.'s Information Industry Practice in San Francisco, disagreed. "It's too little, too late," he said. "I would certainly expect there to be a couple of SL machines a couple of pounds lighter than that by the end of

the third quarter, and I think the price is a bit stiff still."

Initial user reactions concur with Hodge, with some respect for Zenith Data's technological offerings.

Current Zenith Data laptop user Barry Larson, director of systems and data processing at Wacocon's Department of Transportation, is interested in purchasing as many as 200 386-based laptops this year. Larson likes the power management capabilities of the SL, but may opt for the cheaper SX notebook.

"For those kind of price differentials [18,000 less for the SX], you have to have some very specific reasons for going with that kind of model, and I'm not sure what applications warrant that sort of thing," he said.

Zenith Data is in the process of a significant reorganization, away from its traditional direct marketing focus. Two weeks ago, it replaced Arthur Lambert, its longtime vice president of worldwide sales and marketing, with Businessland, Inc. executive Michael J. Peesher.

Special-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0191-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing Inc., 375 Cochichewick Road, Box 9171, Framingham, Mass. 01701-4171.
Copyright 1991 by CW Publishing Inc. All rights reserved.
Computerworld can be purchased at microfilm and microfiche through University of Microfilms Inc., 300 North Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed.
Back issues, if available, may be purchased through Margaret McDowell, at \$2.00 per issue, plus postage.
Photocopying: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Publishing Inc., for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$2.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.
Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by CW Publishing Inc., for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$2.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.
Requests for further information will be honored only if received within 60 days of issue date.
Subscription rates: \$2.50 a copy U.S. — \$4.00 a year; Canada — \$10.00 a year; Central & S. America — \$13.00 (airmail) \$25.00 (airmail) a year; Europe — \$19.00 a year; all other countries — \$20.00 a year. Four months notice is required for change of address. Allow six weeks for new subscriptions to begin. Subscriptions call toll free (800) 869-1002.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2644, Marlow, MD 20765.

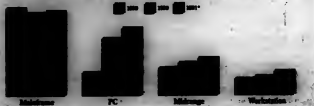
TRENDS

1991 SOFTWARE OUTLOOK

Software expenditures show software for mainframe systems getting less of the budget each year as more emphasis is placed on distributed environments

Average spending per company
in thousands
from 1,043 companies

Although mainframe groups spend the most money on software, spending has become stagnant. PC software expenditures, on the other hand, have almost tripled since 1989

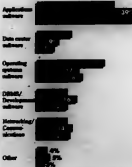


Projected

Software spending by
application
(Percent of 1991 software budget)
from 1,043 companies

Applications software absorbs a majority of the software budget. However, mainframe sites are not allocating as much of their budget to applications as PC and DEC VAX sites

Mainframe 24% PC 47%

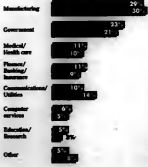


Source: Strategy Market Research, Waltham, Mass.

Software spending
by industry
(Percent of total
software expenditures)

The manufacturing and communications industries anticipate an increase in software expenditures during 1991, while those suffering cutbacks will include education and research

1990 \$2.2B 1991 \$2.5B



Projected

Source: Chart-Tech Associates

NEXT WEEK

The CEO View takes a hard look at outsourcing through the eyes of Derek Kaufman, president of Diesel Technology in Wyoming. Mich. Kaufman discusses his 1988 decision to hand over the firm's information systems to EDS, as well as his thoughts on information technology at a Rust Belt manufacturer, in this week's Manager's Journal.



If the struggle to manage interconnected LANs is a familiar one to you, don't miss next week's Product Spotlight. We can't offer a one-stop solution for integrated network management (nobody can), but we can brief you on how people are coming as close to it as they can, whether through standards or by paying close attention to vendor alliances.

INSIDE LINES

One name stands out

► First Boston Corp. will outsource its data center and voice and data communications to it — if it decides to outsource at all. Chief Information Officer Charles Meyer said recently. The investment firm has been in negotiations with several outsourcing vendors but will go with IBM if Meyer can be convinced that outsourcing won't cost First Boston the chance to capitalize on the price/performance gains of more decentralized processing on departmental servers. The firm runs three IBM 3090 Model 500s in its data center near Princeton, N.J.

Windows on Phase

► Our brethren in London report that Borland International Chairman Philippe Kahn recently confirmed that his company will deliver a Dbase compiler for Microsoft's Windows that works with Borland's Paradox Engine. But the product should not be expected for another year. The compiler — dubbed Turbo Xbase for Windows — forms part of the company's strategy for giving large corporate users access to different data sources. Paradox Engine is intended to act as the central component for data access in large companies, letting firms integrate their desktop PCs with other servers, such as Oracle and Microsoft's SQL Server.

Drawn to Windows, grumpily

► A crowd of Fox Software's Paradox DBMS users was recently wooed by a demonstration of Paradox Version 2.0 at a Boston Computer Society meeting. When asked about an Apple Macintosh version of the product, Fox President David Fulton responded that a beta-test release of the product should be available in about 90 days, adding, "I want this store than you do." As for a Microsoft Windows version? "The Windows product will have all the same features as [Version 2.0], plus chicker buttons and all that [baloney] — and it will run slower, unless we can help it," Fulton replied.

Perfect words for Windows, some day

► Orem, Utah-based Wordperfect now says that its Wordperfect for Windows, originally slated for release in June, won't make an appearance until "late summer" — although it declined to say why. There aren't even any beta-test users out there, the firm said.

Why should Unix go unscathed?

► So you thought maybe Netview/PC is finally headed for the dustbin, now that IBM has direct LU6.2 links plus an AIX-based platform to link third-party equipment to Netview? Wrong. IBM Network Management Director Bill Warner says: You can expect an AIX version of Netview/PC, too, "to add to the range of choices."

Your humble subject could use this

► Apple's research and development labs are busy working on a technology for PC users that recognizes repetitive computational tasks and writes a macroprogram to streamline their execution. The technology, code-named "Eager," was demonstrated by Apple Vice President of Advanced Technology Dave Nagel at Demo '91 recently in Palm Springs, Calif.

First the pizza box, now the fridge

► Rumor has it that the engineers at Data General have been busy gearring up for the next big product announcement, scheduled for late next month. DG watchers predict that the company will unveil a successor to its high-end MY 40000 proprietary computing platform. There has also been speculation that the company will be throwing in some advanced disk storage products for good measure.

Microsoft's been flooding the mails with a nifty little magazine titled Focus on Windows that promotes the Windows Resource Kit. One user told us his firm received three such mailings with three different prices: \$29.95, \$14.50 and zip. We've told the way to get the best price is to call the toll-free number and tell Microsoft that your code on the mailing label is A.A.E. We've tried, but there's never an answer. You can always get through to News Editor Pete Bartelstein, though. Call (800) 343-6474, ask him a fax at (508) 875-8931 or sip a line to him on CompuServe ID, 76537.3413.



The biggest computer news isn't just coming out of Apple. It's going into it.

MACIRMAtrac: THE MOST FLEXIBLE MAC TOKEN-RING BOARD

Despite today's myriad of connectivity options, there's really only one decision to make. And that decision is our new MacIRMAtrac™ Token-Ring Adapter.



With our replaceable RIM technology, you'll never have to worry about buying another token-ring board.

With DCA's MacIRMAtrac, Macintosh® users can handle many different growth possibilities both now and in the future. This unmatched flexibility is the result of our replaceable ring interface module (RIM) technology that allows a single token-ring board to adapt in many ways.

By offering 4 Mbps and 4/16 Mbps

RIMs, and 4/16 fiber optic RIMs in the near future, MacIRMAtrac is truly the ultimate solution to meet all of your token-ring connectivity needs.

For instance, let's say your present cabling method is twisted pair, but you see a move to fiber optic sometime in the future. Well now you need only buy a new RIM to make the change.

As new technologies emerge, new RIMs will let you migrate easily without purchasing another board.

We also offer the same technology in IRMAtrac™, our convertible PC Token-Ring board. In fact, the RIMs are actually interchangeable between MacIRMAtrac and IRMAtrac. Plus, you'll have a single source for purchasing, support, training, updates, and upgrades for your Mac, PC and PS/2® token-ring network.

DCA's MacIRMAtrac supports all Macs with NuBus (Mac II) architecture

and it's fully compatible with AppleTalk®. And combined with our award winning MacIRMA® WorkStation 3270 software, MacIRMAtrac now allows you to connect with more SNA environments than with any other Mac-to-mainframe solution.

So now, with all the flexibility we offer, you can make the choices that are right for your business without having to sacrifice your initial investment.

For information on MacIRMAtrac and how to receive your free token-ring board for a trial period as part of our exciting Grand LANplan promotion, just call us at 1-800-348-DCA-1, ext. 68E.*

MacIRMAtrac Token-Ring Adapter. Because what you get out of your Mac is only as good as what goes into it.


*Offer good in U.S. and Canada only. ©1991 Digital Communications Associates, Inc. All rights reserved. DCA and MacIRMA are registered trademarks and MacIRMAtrac and IRMAtrac are trademarks of Digital Communications Associates, Inc. All other brand or product names are trademarks or registered trademarks of their respective owners.

ALL CASE vendors offer product. Only one offers the BACHMAN vision.

**BACHMAN delivers
proven software
productivity through
Model Driven
Development™ now.**

When you examine most CASE vendors, they end up looking very much alike.

All except for BACHMAN. We offer you a unique vision of how your organization can move into the next century of applications and systems development with products and services available now.

BACHMAN provides an architecture to dramatically increase productivity, supported by the best consulting and training services available.

Discover BACHMAN Model Driven Development™
Start sharing in the vision today.

1-800-BACHMAN.

BACHMAN

